

Index of Theme 2 (Units 5 to 8)

UNIT 5



Multiplication as a Relationship

Concept 1 Multiplicative Comparisons

- Lesson 1** 5-1 Understanding Multiplicative Comparison 8
- Lesson 2** 5-2 Creating Multiplicative Comparison Equations
- 5-3 Solving Multiplicative Comparison Equations 15

Concept 2 Properties and Patterns of Multiplication

- Lesson 3** 5-4 Commutative Property of Multiplication
- 5-5 Patterns of Multiplying by 10s
- 5-6 Review Exploring Patterns in Multiplication 28
- Lesson 4** 5-7 Exploring More Patterns in Multiplication
- 5-8 Applying Patterns in Multiplication 39

UNIT 6



Factors and Multiples

Concept 1 Understanding Factors

- Lesson 1** 6-1 Identifying Factors of Whole Numbers
- 6-2 Prime and Composite Numbers 56
- Lesson 2** 6-3 Greatest Common Factor 70

Concept 2 Understanding Multiples

- Lesson 3** 6-4 Identifying Multiples of Whole Numbers
- 6-5 Common Multiples 82
- Lesson 4** 6-6 Relationships between Factors and Multiples 91

UNIT 7



Multiplication and Division : Computation and Relationships

Concept 1

Multiplying by 1-Digit and 2-Digit Factors

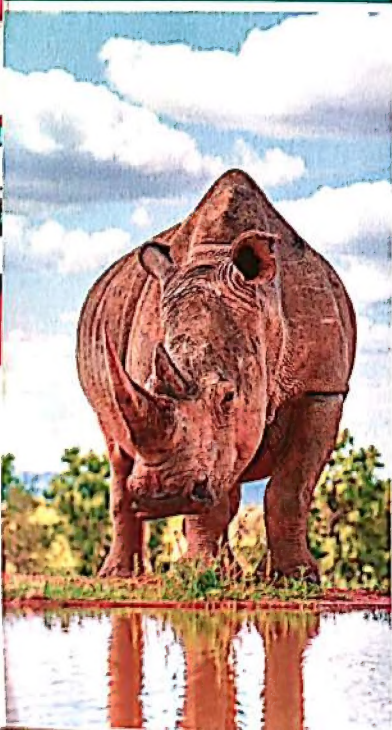
Lesson 1	7-1	The Area Model Strategy	
	7-2	The Distributive Property	104
Lesson 2	7-3	The Partial Products Algorithm	
	7-4	The Standard Multiplication Algorithm	
	7-5	Review Connecting Strategies	116
Lesson 3	7-6	Two-Digit Multiplication	
	7-7	Area Models and Two-Digit Multiplication	128
Lesson 4	7-8	Algorithms and Two-Digit Multiplication	
	7-9	Putting It All Together	137

Concept 2

Dividing by 1-Digit Divisors

Lesson 5	7-10	Exploring Remainders	152
Lesson 6	7-11	Patterns and Place Value in Division	158
Lesson 7	7-12	The Area Model and Division	166
Lesson 8	7-13	The Partial Quotients Algorithm	
	7-14	The Standard Division Algorithm	176
Lesson 9	7-15	Division and Multiplication	
	7-16	Solving Challenging Story Problems	188

UNIT 8



Order of Operations

Concept 1

Order of Operations

Lesson 1	8-1	Problem - Solving Strategies	206
Lesson 2	8-2	Which Comes First ?	
	8-3	Order of Operations	
	8-4	The Order of Operations and Story Problems	213

GLOSSARY

Multiplication as a Relationship

» **Concept 1** : Multiplicative Comparisons

» **Concept 2** : Properties and Patterns of Multiplication



Fast Fact

An adult grasshopper can jump 10 times its length straight into the air and 20 times its length horizontally without using its wings. That is, if a grasshopper is 5 centimeters long, it can jump a distance of 1 meter.



Concept

1

Multiplicative Comparisons





Fast Fact

*The ant is one of the world's strongest creatures in relation to its size. A single ant can carry **50 times** its own bodyweight, and they'll even work together to move bigger objects as a group!*

Concept Overview

In concept 1:

Multiplicative Comparisons, students continue to compare numbers but move away from place value comparisons into multiplicative relationships. It is important for students to review and recall the multiplication facts they learned in Primary 3, since this makes it easier for them to see multiplicative relationships in familiar numbers. Students also discuss the application of multiplicative comparisons in real-world contexts, connecting their understanding of math to their daily lives.

Lesson No.	Lesson Name	Vocabulary Terms	Learning Objectives
Lesson 1	5-1 Understanding Multiplicative Comparison	Estimate - Multiplicative comparison - Tape diagram	<ul style="list-style-type: none">• Students will define multiplicative comparison.• Students will model multiplicative comparison problems.
Lesson 2	5-2 Creating Multiplicative Comparison Equations	Equation - Factor - Multiplicative comparison - Product	<ul style="list-style-type: none">• Students will create equations to represent multiplicative comparison problems.• Students will use letters to represent unknown quantities in equations.
	5-3 Solving Multiplicative Comparison Equations	Inverse	<ul style="list-style-type: none">• Students will create and solve multiplicative comparison equations.

Lesson 1

5-1 Understanding Multiplicative Comparison

Learn What is multiplicative comparison ?

Multiplicative comparison means comparing two things or sets that need multiplication.

For Example : In a birthday party,

Amgad has 3 balloons



Bassem has 6 balloons



You can use multiplication as a way to compare between what they have as follows :

Tape diagram	Comparison statement	Multiplication equations
<p>Amgad :</p> <div style="border: 1px solid black; padding: 2px; display: inline-block;">3 balloons</div> <p>Bassem :</p> <div style="display: inline-block; border: 1px solid black; padding: 2px;">3 balloons</div> <div style="display: inline-block; border: 1px solid black; padding: 2px; margin-left: 10px;">3 balloons</div>	<p>Bassem has twice as many balloons as Amgad has.</p> <p>Or 6 is two times greater than 3</p>	$6 = 2 \times 3$



Remember

Multiplication is repeated addition.

So, you can rewrite a multiplication equation as repeated addition equation.

$$6 = 2 \times 3 \quad \Rightarrow \quad 3 + 3 = 6$$

Hint

$6 = 2 \times 3$ means
6 is two times greater than 3
Or 6 is three times greater than 2

Notes for parents :

- Make sure your child understands that the "tapes" in the tape diagram represent equal groups. When constructing a tape diagram, each tape should represent the same quantity.

Example 1

Complete the comparison statements. Use tape diagram or multiplication facts to compare.

- a. Compare 15 and 5. 15 is _____ times greater than 5.
 b. Compare 50 and 10. 50 is _____ times greater than 10.

Solution 

- a. three [think:

5	5	5
---	---	---

, $15 = 3 \times 5$] b. five [think:

10	10	10	10	10
----	----	----	----	----

, $50 = 5 \times 10$]

Example 2

Rewrite each equation using multiplication.

- a. $5 + 5 + 5 = 15$ b. $3 + 3 + 3 + 3 + 3 + 3 + 3 = 21$

Solution 

- a. $3 \times 5 = 15$ b. $7 \times 3 = 21$

Example 3

Fill in the blanks to complete the multiplicative comparison statement for each tape diagram.

a.

8	8	8	8	8	8
---	---	---	---	---	---

_____ is _____ times greater than 8

b.

5	5	5	5	5	5	5	5
---	---	---	---	---	---	---	---

_____ is _____ times greater than 5

Solution 

- a. 48 is 6 times greater than 8. b. 40 is 8 times greater than 5.

 **Check** your understanding

Complete the table. Write a comparison statement or a multiplication equation.

Comparison Statement	Multiplication Equation
21 days is 3 times longer than 7 days	
	$36 = 9 \times 4$
30 fish is 5 times as many as 6 fish.	

• Children often confuse multiplicative comparison with additive comparison. For example, instead of multiplying by 4 to find a number 4 times greater than 20, they might add 4

Exercise 26

5-1 Understanding Multiplicative Comparison

REMEMBER







UNDERSTAND

APPLY



PROBLEM SOLVING

From the school book

1. Use tape diagram or multiplication facts to compare the numbers.

- | | |
|--|-----------------------------------|
| a.  Compare 15 and 3. | 15 is _____ times greater than 3. |
| b.  Compare 28 and 7. | 28 is _____ times greater than 7. |
| c.  Compare 27 and 9. | 27 is _____ times greater than 9. |
| d.  Compare 10 and 2. | 10 is _____ times greater than 2. |
| e.  Compare 12 and 3. | 12 is _____ times greater than 3. |
| f.  Compare 18 and 6. | 18 is _____ times greater than 6. |
| g. Compare 18 and 9. | 18 is _____ times greater than 9. |
| h. Compare 21 and 7. | 21 is _____ times greater than 7. |
| i. Compare 24 and 6. | 24 is _____ times greater than 6. |
| j. Compare 35 and 7. | 35 is _____ times greater than 7. |
| k. Compare 30 and 5. | 30 is _____ times greater than 5. |
| l. Compare 56 and 8. | 56 is _____ times greater than 8. |
| m. Compare 72 and 8. | 72 is _____ times greater than 8. |
| n. Compare 54 and 9. | 54 is _____ times greater than 9. |
| o. Compare 30 and 3. | 30 is _____ times greater than 3. |
| p. Compare 8 and 4. | 8 is _____ times greater than 4. |
| q. Compare 27 and 3. | 27 is _____ times greater than 3. |
| r. Compare 20 and 5. | 20 is _____ times greater than 5. |
| s. Compare 25 and 5. | 25 is _____ times greater than 5. |
| t. Compare 36 and 6. | 36 is _____ times greater than 6. |

2. Rewrite each equation using multiplication.

- a.  $6 + 6 + 6 = 18$ _____
- b.  $2 + 2 + 2 + 2 + 2 + 2 + 2 = 14$ _____
- c. $5 + 5 + 5 = 15$ _____
- d. $2 + 2 + 2 + 2 = 8$ _____
- e. $9 + 9 + 9 + 9 = 36$ _____
- f. $10 + 10 + 10 + 10 + 10 = 50$ _____
- g. $8 + 8 + 8 + 8 + 8 + 8 + 8 = 56$ _____
- h. $7 + 7 + 7 + 7 = 28$ _____
- i. $3 + 3 + 3 + 3 + 3 + 3 + 3 = 21$ _____
- j. $4 + 4 + 4 + 4 + 4 = 20$ _____

3. Complete each of the following.


- a. $3 + 3 + 3 + 3 =$ _____ \times _____ $=$ _____
- b. $4 + 4 + 4 =$ _____ \times _____ $=$ _____
- c. $2 + 2 + 2 + 2 + 2 =$ _____ \times _____ $=$ _____
- d. $8 + 8 =$ _____ \times _____ $=$ _____
- e. $7 + 7 + 7 + 7 + 7 + 7 + 7 =$ _____ \times _____ $=$ _____
- f. $5 + 5 + 5 + 5 + 5 + 5 =$ _____ \times _____ $=$ _____

4. Fill in the blanks to complete the multiplicative comparison statement for each tape diagram.

a. 


5	5	5	5
---	---	---	---

_____ is _____ times greater than 5.

b. 

8	8	8
---	---	---

_____ is _____ times greater than 8.

c. 

4	4	4	4
---	---	---	---

_____ is _____ times greater than 4.

d.

2	2	2	2	2	2
---	---	---	---	---	---

_____ is _____ times greater than 2.

e.

3	3	3	3	3	3	3
---	---	---	---	---	---	---

_____ is _____ times greater than 3.

f.

6	6	6	6	6	6	6	6
---	---	---	---	---	---	---	---

_____ is _____ times greater than 6.

g.

10	10	10	10
----	----	----	----

_____ is _____ times greater than 10.

h.

7	7	7	7	7	7	7	7
---	---	---	---	---	---	---	---

_____ is _____ times greater than 7.

i.

9	9	9	9	9	9	9	9	9	9
---	---	---	---	---	---	---	---	---	---

_____ is _____ times greater than 9.

j.

10	10	10	10	10
----	----	----	----	----

_____ is _____ times greater than 10.

5. Write a multiplication equation to match each comparison statement as the example.

	Comparison Statement	Multiplication Equation
Ex.	10 is 5 times greater than 2	$10 = 5 \times 2$
a.	24 is 6 times greater than 4	
b.	35 is 7 times greater than 5	
c.	15 is 3 times greater than 5	
d.	20 is 4 times greater than 5	
e.	60 is 10 times greater than 6	
f.	16 is 8 times greater than 2	
g.	6 is 2 times greater than 3	
h.	5 is 5 times greater than 1	

6. Write a comparison statement to match the multiplication equation as the example.

	Comparison Statement	Multiplication Equation
Ex.	8 is 2 times greater than 4	$8 = 2 \times 4$
a.		$6 = 3 \times 2$
b.		$24 = 8 \times 3$
c.		$45 = 9 \times 5$
d.		$30 = 6 \times 5$
e.		$70 = 10 \times 7$
f.		$12 = 3 \times 4$

Challenge

7. Suzie is 14 dm tall. There is a tree in her yard that is 10 times taller than she is. How tall is the tree in Suzie's yard?



8. Hanan has 40 photos. She has 5 times as many photos as Hany. How many photos does Hany have?

Hany

Hanan

40



Multiple Choice Questions

Choose the correct answer.

1. To compare 20 and 5.

- 20 is _____ times greater than 5.
- A. 2 B. 3
C. 4 D. 5

2. To compare 30 and 6.

- 30 is _____ times greater than 6.
- A. 3 B. 4
C. 5 D. 6

3. The multiplication equation of $5 + 5 + 5 + 5 = 20$ is _____

- A. $2 \times 10 = 20$ B. $4 \times 5 = 20$
C. $20 \times 1 = 20$ D. $10 + 10 = 20$

4. The multiplication equation of $6 + 6 + 6 = 18$ is _____

- A. $18 \times 1 = 18$ B. $8 + 10 = 18$
C. $2 \times 9 = 18$ D. $3 \times 6 = 18$

5. The multiplication equation of the comparison statement "36 is 4 times greater than 9" is _____

- A. $9 + 9 + 9 + 9 = 36$ B. $36 = 6 \times 6$
C. $36 = 4 \times 9$ D. $3 \times 12 = 36$

6. The comparison statement for the multiplication equation " $24 = 3 \times 8$ " is _____

- A. 24 is 3 times smaller than 8.
B. 24 is 3 times greater than 8.
C. 8 is 3 times greater than 24.
D. 3 is 8 times greater than 24.

7. To compare 45 and 9.

- 45 is _____ times greater than 9.
- A. 5 B. 4
C. 3 D. 2

8. The multiplication equation of $10 + 10 + 10 = 30$ is _____

- A. $5 \times 6 = 30$ B. $3 \times 10 = 30$
C. $10 + 20 = 30$ D. $1 \times 30 = 30$

9. The multiplication equation of the comparison statement "20 is 10 times greater than 2" is _____

- A. $20 = 10 \times 2$ B. $20 = 10 + 10$ C. $20 = 4 \times 5$ D. $20 = 1 \times 20$

10. Which statement is an example of a multiplicative comparison? _____

- A. A camel is 3 meters in length. A crocodile is 2 meters longer than a camel.
B. A camel can weigh up to 1,000 kilograms. This is twice as much as a crocodile weighs.
C. Crocodiles have 64 teeth. Camels have 32 fewer teeth than crocodiles.
D. There are about 30,000 crocodiles in Egypt. There are about 60,000 more camels in Egypt.

Lesson 2

5-2 Creating Multiplicative Comparison Equations

5-3 Solving Multiplicative Comparison Equations

Learn

During Emad's visit to the Zoo, he read this information.

Can you help him to calculate the tall of the giraffe ?



The giraffe in the zoo is 3 times as tall as the kangaroo. The kangaroo is 2 m tall. How tall is the giraffe?

Read and Understand

What do you know ?

The kangaroo is 2 m tall.

What are you trying to find ?

Find how tall is the giraffe.

Plan and Solve

What strategy will you use ?

Strategy: Write a multiplicative comparison equation

1. Use a letter to represent the unknown.
Let the tall of the giraffe be x .
2. The giraffe is 3 times as tall as the kangaroo means,
 x is 3 times 2



3. Write an equation : $x = 3 \times 2$

4. Solve the equation : $x = 6$

So, the giraffe is 6 m tall

Notes for parents :

- **Common Error :** Your child may incorrectly place the unknown in an equation. For example, if your child is asked to write 12 is 3 times greater than a , he/she may write $12 \times 3 = a$, instead of $12 = 3 \times a$ or $3 \times a = 12$

Example 1

Write an equation based on the comparison statement.

Use a letter to represent the unknown.

a. 3 times greater than 5 is _____

b. 12 is 6 times as many as _____

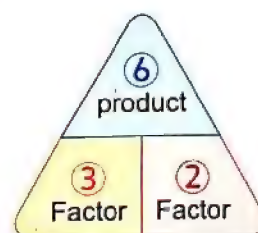
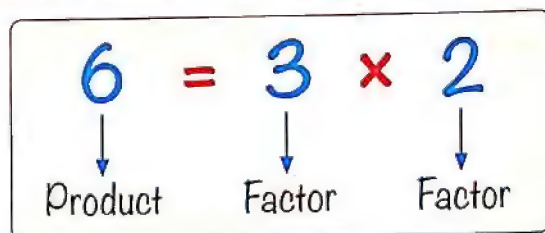
Solution 

a. $3 \times 5 = a$

b. $12 = 6 \times m$

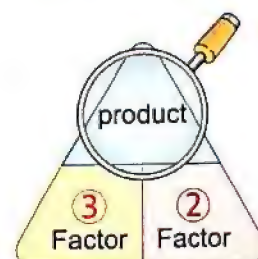
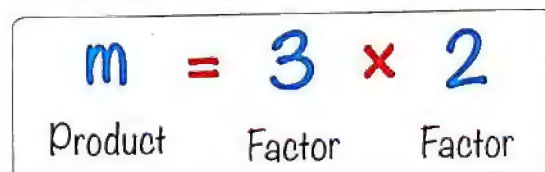
How to solve multiplication comparison equation ?

You know that



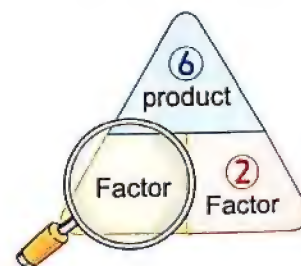
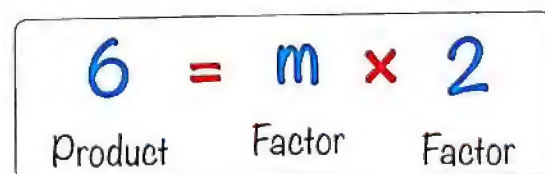
- Solving an equation means to find the value of the unknown that makes the equation true.

1. If the unknown is the **product**, use **multiplication**.



Multiply: $m = 6$

2. If the unknown is **one of the two factors**, use **division**.



Divide: $m = 6 \div 2 = 3$

Example 2

Write an equation for each of the following comparisons and then solve it.

a. What number is 3 times greater than 7?

b. 24 is 4 times more than what number?

c. 12 is 3 times more than what number?

Notes for parents :

- It is important to note that the unknown can be in different positions in the equation. Explain that to solve an equation, you find what the unknown number is.

Solution 

a. Equation : $3 \times 7 = m$

Answer : $m = 21$

The number is **21**

b. Equation : $24 = 4 \times h$

Answer : $h = 24 \div 4 = 6$

The number is **6**

c. Equation : $12 = 3 \times a$

Answer : $a = 12 \div 3 = 4$

The number is **4****Example 3**

Write an equation for the following comparison and then solve.

Wael ate 5 figs in the evening. His older brother ate 4 times as Wael ate.

How many figs did his brother eat ?

Solution 

Let the number of figs of his brother is a

• Equation : $a = 4 \times 5$

• Answer : $a = 20$

His brother ate 20 figs.

**Example 4**

There were thirty-five adults in line at a movie theater. That is seven times the number of children in another line. How many children were in this line ?

Solution 

Let the number of children is n. Then, 35 equal 7 times n

• Equation : $35 = 7 \times n$

• Use division to solve : $n = 35 \div 7 = 5$

So, the number of children in the line is 5 children.

**Check** your understanding

1. Solve each of the following equations.

a. $x = 3 \times 6$

b. $14 = 7 \times n$

c. $6 \times y = 24$

2. Write an equation to represent the situation below, and then solve.

Farmer Wael has 20 sheep. He has twice the number of sheep as farmer Sameh.

What is the number of sheep of farmer Sameh ?

• Explain that the missing number in an equation is represented by a blank, but we can use letters to represent missing numbers.

Exercise 27

5-2 Creating Multiplicative Comparison Equations 5-3 Solving Multiplicative Comparison Equations

REMEMBER

UNDERSTAND

APPLY

PROBLEM SOLVING


From the school book

1. Write an equation based on the comparison statement. Use a letter to represent the unknown number. You do not have to solve the equations.


- a. 4 times greater than 3 is _____
- b. 18 is 6 times as many as _____
- c. 2 times greater than 7 is _____
- d. 24 is 4 times as great as _____
- e. 25 is 5 times as many as _____
- f. 16 is 4 times as many as _____
- g. 7 times greater than 2 is _____
- h. 5 times greater than 8 is _____
- i. 30 is 5 times as many as _____
- j. 3 times greater than 10 is _____
- k. 7 times as many as 4 is _____
- l. 6 times greater than _____ is 48.
- m. 27 is _____ times greater than 9.
- n. 10 times as 3 is _____
- o. 6 is _____ times greater than 2.
- p. 3 times as 6 is _____
- q. 15 is _____ times greater than 5.
- r. 8 times greater than _____ is 24.
- s. 20 is _____ times greater than 4.
- t. 5 times greater than _____ is 15.




2. Write an equation for the comparisons. Use a letter to represent the unknown number.
You do not have to solve the equations.

- a.  Nadia collected 5 marbles in March. By May she had 4 times as many marbles. How many marbles does Nadia have in May?




- b.  Hamed had 12 cookies, which was 3 times as many cookies as his brother Ahmed. How many cookies did Ahmed have?




- c.  It took Aida 21 minutes to walk to school on Monday. On Tuesday, it took her 7 minutes to ride her bike to school. How many times faster was riding her bike than walking?



- d.  Menna ran around the soccer field 4 times. Aya ran around the field twice as many times. How many times did Aya run around the field?



- e.  Rana has 6 mangoes. Her brother Sherif has 18. How many times more mangoes does Sherif have?



- f. A library checks out four mathematics books and two sciences books an hour. How many times more mathematics books do they check out than sciences books?



- g. A restaurant sold eight times as many salads as they sold steaks. If they sold four steaks, how many salads did they sell?



- h. A restaurant sold nine salads and forty-five steaks.
How many times as many steaks did they sell as salads?



- i. A pet store sold two cats. They sold six times as many dogs as they sold cats. How many dogs did they sell?



3. Write an equation for each of the following comparisons, and then solve it.

- a. What number is 5 times greater than 6?

- b. 36 is 4 times more than what number?

- c. Ayman ate 4 figs in the morning. His older brother ate 3 times as many. How many figs did his brother eat?



- d. There were thirty-two adults and four children in line at a movie theater. How many times more adults were in the line than children?



- e. Mona sent twenty-five text messages a day. Esslam sent five a day. How many times as many texts did Mona send than Esslam sent ?



- f. It takes Wael six oranges to make a small glass of orange juice. He uses eight times as many for a large glass. How many oranges does he use for a large glass ?



- g. Nora had four times as many Pounds as her sister. Her sister has three Pounds. How much money does Nora have ?



- h. Samah was playing basketball. She scored seven times as many shots as she missed. If she scored fourteen shots, how many shots did she miss ?



4. Solve each of the following.

a. $y = 5 \times 10$

b. $x \times 3 = 15$

c. $7 \times b = 21$

d. $3 \times 4 = x$

e. $5 \times b = 50$

f. $m \times 4 = 16$

g. $z = 5 \times 1$

h. $n \times 2 = 18$

i. $5 \times k = 35$

5.



Empty Bus Seats



Motorbike

How many seats? Use the information in the table to compare numbers of seats in different modes of transportation. Then, enter and solve an equation for each comparison.

Means of Transportation	Number of Seats
Bike	1
Motorcycle	2
Car	4
Truck	6
Bus	36
Metro train	48

- a. How many times as many seats are in a truck than on a motorbike?

Equation: _____

Answer: _____

- b. How many times as many seats are on a bus than in a truck?

Equation: _____

Answer: _____

- c. How many times as many seats are on the metro train than in a car?

Equation: _____

Answer: _____

- d. A metro train can fit how many times more people than a truck?

Equation: _____

Answer: _____

- e. A bus has how many times more seats than a car?

Equation: _____

Answer: _____



Challenge

6. Bassem sold 9 chocolate bars. Marawan sold three times as many as Bassem. Esslam sold 9 fewer than Marawan. How many bars did Esslam sell?



Multiple Choice Questions

Choose the correct answer.

1. The equation based on the comparison statement «3 times greater than 7» is _____

A. $3 \times 7 = A$ B. $7 - 3 = A$
C. $3 + 7 = A$ D. $7 \div 3 = A$

2. The equation based on the comparison statement «45 is _____ times greater than 9» is _____

A. $45 = 9 - a$ B. $45 = a \times 9$
C. $45 = a + 9$ D. $45 = 9 - b$

3. What number is 10 times greater than 13?

A. 130 B. 3
C. 23 D. 1,300

4. There were 24 adults and 3 children in line at a movie theater. How many times more adults were in the line than children?

A. 28 B. 36
C. 7 D. 8

5. Noha sent 18 text messages a day. Ali sent 3 a day. How many times as many texts did Noha send than Ali?

A. 5 B. 4
C. 3 D. 6

6. It takes Wael 7 oranges to make a small glass of orange juice. He uses 6 times as many for a large glass. How many oranges does he use for a large glass?

A. 14 B. 42
C. 2 D. 68

7. Ola had 4 times as many dollars as her sister. Her sister has 3 dollars. How much money does Ola have?

A. 10 B. 11
C. 12 D. 13

8. Hala was playing basketball. She made seven times as many shots as she missed. If she made 28 shots, how many shots did she miss?

A. 1 B. 2
C. 3 D. 4

9. Which situation is an example of a multiplicative comparison?

A. When Osama arrived at work, there were 48 cars in the parking lot. When he left work, there were 3 fewer cars in the lot.
B. Tony weighs 27 kilograms. His brother is 9 kilograms heavier.
C. Nasser began his collection with 12 trading cards. After 1 month, there are triple the number of cards in his collection.
D. Youssef read 15 books last year. Tarek read 5 books.

10. Hany is twice as old as his brother. His brother is 8 years old. Which two equations can be used to find Hany's age?

A. $2 + a = 8$ B. $2 \times a = 8$ C. $2 \times 8 = a$ D. $8 + 2 = a$ E. $8 + 8 = a$

Concept 1 Assessment | Unit 5



1. Put (✓) to the correct answer and (X) to the incorrect answer.

- a. The multiplicative comparison statement for

5	5	5	5	5	5
---	---	---	---	---	---

 is «30 is 6 times greater than 5». []
- b. The multiplication equation for the comparison statement «60 is 10 times greater than 6» is $60 = 10 + 6$ []
- c. The answer of the equation $24 = 4 \times h$ is $h = 6$ []
- d. If $18 = a \times 2$, then $a = 6$ []
- e. 20 is 5 times smaller than 4. []
- f. 5 times greater than 3 is 15. []

2. Choose the correct answer.

- a. What number is 5 times greater than 4 ?
 ● A. 54 B. 20 C. 45 D. 9
- b. 36 is 9 times more than what number ?
 ● A. 45 B. 27 C. 4 D. 369
- c. Mostafa and his sister peeled oranges. Mostafa peeled 6 oranges. Mostafa's sister peeled 3 times as many oranges as Mostafa. Which equation can be solved to find the number of oranges that Mostafa's sister peeled ?
 ● A. $6 + 3 = n$ B. $6 \times 3 = n$ C. $n + 3 = 6$ D. $n \times 3 = 6$
- d. A box has 8 green balls. The box has 6 times as many yellow balls as green balls. How many yellow balls are in the box ?
 ● A. 2 B. 14 C. 48 D. 54
- e. A fish tank has 3 red fish and 17 times as many blue fish. How many blue fish are in the tank ?
 ● A. 20 B. 31 C. 17 D. 51
- f. A building is 20 meters tall. A bridge is 5 meters tall. The building is how many times taller than the bridge ?
 ● A. 3 B. 4 C. 15 D. 100

3. Complete.

- a. 10 times as 3 is _____
- b. 20 is _____ times greater than 5.
- c. 16 is 4 times as many as _____
- d. The comparison statement for the multiplication equation $30 = 5 \times 6$ is _____
- e. The multiplicative equation of $6 + 6 + 6 + 6 + 6 = 30$ is _____
- f. If $a \times 3 = 24$, then $a =$ _____

4. Match the cards that have the same meaning.

a. 24 is 6 times greater than 4

b. 5 is 5 times greater than 1

c. 35 is 7 times greater than 5

d. 16 is 8 times greater than 2

1. $5 = 5 \times 1$

2. $24 = 6 \times 4$

3. $16 = 8 \times 2$

4. $35 = 7 \times 5$

5. A fruit plate contains 21 grapes and the grapes is 3 times as many as dates.

Choose the best equation or number to complete the statement.

$a \times 21 = 3$

$3 \times a = 21$

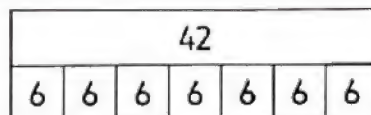
$3 \times 21 = a$

6

7

63

6. A model is shown.



Write an equation which is the best represented by this model ?

7. The distance from Samir's house to the bank is 5 times the distance from his house to the museum. If his house is 20 kilometers from the museum, how many kilometers is his house from the bank.

8. A truck driver delivers a total of 12 crates of fruits and vegetables to a store. The total number of crates of fruits and vegetables is 3 times as many as the number of crates of apples. How many crates of apples were delivered ?

9. A hotel has 28 floors. The hotel has 4 times as many floors as the building next door. How many floors does the building next door have ?

10. Mona has 4 apples. Her sister Hala has 20 apples. How many times more apples does Hala have ?

11. A pet store sold 3 cats. They sold six times as many dogs as they sold cats. How many dogs did they sell ?

12. Write the equation $5 + 5 + 5 + 5 = 20$ by using multiplication.

Concept

2

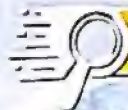
Properties and Patterns of Multiplication



Concept Overview

In concept 2 :

Properties and Patterns of Multiplication, students continue to work to build deep understanding of multiplication as well as procedural fluency. Their work in Primary 3 with multiplication facts takes on greater importance in Primary 4 as they begin to use those facts to solve more complex multiplication problems. Students are challenged to identify, describe, and apply patterns in multiplication – particularly when multiplying by multiples of 10 – to increase fluency and efficiency. Students also investigate and apply several properties of multiplication, including the identity Property, the Zero Property, the Commutative Property, and the Associative Property. It is important that students build understanding that the properties are not just descriptive, but can be utilized to improve their efficiency and accuracy in multiplication.



Fast Fact

The fastest man in the world is Usain Bolt. He can run about 44 kilometers per hour for short distances. One of the fastest cars in the world in 2017 was driven to an average speed 10 times faster than Usain Bolt. How fast can this car move?

Lesson No.	Lesson Name	Vocabulary Terms	Learning Objectives
Lesson 3	5-4 Commutative Property of Multiplication	Array - Column - Commutative Property of Multiplication - Factor - Horizontal - Product - Row - Vertical	<ul style="list-style-type: none"> Students will explain the Commutative Property of Multiplication. Students will apply the Commutative Property of Multiplication to solve problems.
	5-5 Patterns of Multiplying by 10s	Identity Property of Multiplication - Zero Property of Multiplication	<ul style="list-style-type: none"> Students will apply the Identity Property of Multiplication to solve problems. Students will apply the Zero Property of Multiplication to solve problems. Students will identify patterns that occur when multiplying by 10, 100, and 1,000.
	5-6 Review Exploring Patterns in Multiplication	Multiples	<ul style="list-style-type: none"> Students will apply place value concepts to multiply by multiples of 10, 100 and 1,000. Students will explain patterns when multiplying by multiples of 10, 100, and 1,000.
Lesson 4	5-7 Exploring More Patterns in Multiplication	Associative Property of Multiplication - Commutative Property of Multiplication - Parentheses	<ul style="list-style-type: none"> Students will explain the Associative Property of Multiplication. Students will apply the Associative Property of Multiplication to solve problems.
	5-8 Applying Patterns in Multiplication	Decompose - Factors - Multiples	<ul style="list-style-type: none"> Students will apply decomposing and the Associative Property of Multiplication to solve equations with multiples of 10, 100, or 1,000.

5-4 Commutative Property of Multiplication

5-5 Patterns of Multiplying by 10s

5-6 Review Exploring Patterns in Multiplication

Learn Multiplication properties

Multiplication properties are rules for multiplication that are always true. In this lesson, you will learn three properties of multiplication.

- Commutative Property.
- Identity Property.
- Zero Property.

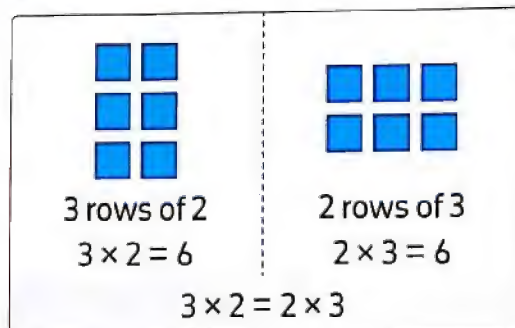
Commutative Property of Multiplication

Sandy knit 3 scarves. She used 2 balls of yarn for each scarf.

How many balls of yarn did she use in all ?
You can use multiplication properties to help you find products.

**Multiply 3×2**

Commutative Property states that when you multiply two factors in any order the product is the same.



So, Sandy used 6 balls of yarn.

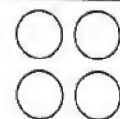
Identity Property of Multiplication

The **Identity Property** states that the product of 1 and any number equals that number.

$$3 \times 1 = 3$$

Zero Property of Multiplication

The **Zero Property** states that the product of zero and any number equals 0.



$$4 \times 0 = 0$$

Notes for parents :

- Using multiplication properties makes finding products easier.

Example 1

Apply the Commutative property of Multiplication to complete each equation.

a. $3 \times 8 = \underline{\hspace{2cm}} \times 3$

b. $10 \times \underline{\hspace{2cm}} = 7 \times 10$

c. $\underline{\hspace{2cm}} \times 5 = 5 \times 9$

d. $2 \times 11 = 11 \times \underline{\hspace{2cm}}$

Solution 

a. 8

b. 7

c. 9

d. 2

Example 2

Apply the Commutative property of Multiplication to find the unknown value.

a. $23 \times 7 = 7 \times a$

b. $5 \times b = 11 \times 5$

c. $9 \times 10 = m \times 9$

d. $k \times 6 = 6 \times 2$

Solution 

a. $a = 23$

b. $b = 11$

c. $m = 10$

d. $k = 2$

Example 3

Mr. Hany has 12 pens. Write an equation using the Commutative property of multiplication to describe two ways he can arrange his pens.

Solution 

• $3 \times 4 = 4 \times 3 = 12$

• $2 \times 6 = 6 \times 2 = 12$

**Example 4**

Look at the problems below. Solve them mentally.

a. 15×1

b. 1×23

c. 1×10

d. 632×1

e. 5×0

f. 171×0

g. 0×7

h. 0×329

Solution 

a. 15

b. 23

c. 10

d. 632

e. 0

f. 0

g. 0

h. 0



• When you multiply any number by 1, the product is equal to that number.

• When you multiply any number by 0, the product is 0

**Check** your understanding

Find the missing number. Name the property you used.

a. $\square \times 1 = 12$

b. $9 \times \square = 0$

c. $5 \times 6 = \square \times 5$

d. $\square \times 500 = 0$

e. $1 \times \square = 708$

f. $2 \times \square = 10 \times 2$

• You may wish to ask your child questions such as the following as you observe your child at work :

- When you multiply with 1, which number is the product ?
- When you multiply any number by 0, which number is the product ?

Learn Multiplying by 10, 100 and 1,000

You can use a **basic fact** and a **pattern** to find the product.

TH	H	T	O
			4
		4	0
	4	0	0
4	0	0	0

$4 \times 1 = 4$

[Think : Use the basic fact $4 \times 1 = 4$]

$4 \times 10 = 40$

[Put 1 zero at the end]

$4 \times 100 = 400$

[Put 2 zeroes at the end]

$4 \times 1,000 = 4,000$

[Put 3 zeroes at the end]

Look for a pattern of zeroes.

Example 5

Fill in the blanks below.

a. $6 \times 10 =$ _____

b. $2 \times 100 =$ _____

c. $7 \times 1,000 =$ _____

d. $21 \times 10 =$ _____

e. $50 \times 10 =$ _____

f. $70 \times 100 =$ _____

g. $90 = 9 \times$ _____

h. $170 =$ _____ $\times 17$

i. _____ $\times 1,000 = 50,000$

Solution

a. 60

b. 200

c. 7,000

d. 210

e. 500

f. 7,000

g. 10

h. 10

i. 50

Check your understanding

What is the value of each of the following.

a. $1,000 \times 5 =$ _____

b. _____ $= 100 \times 1$

c. $30 \times 10 =$ _____

d. $800 = 8 \times$ _____

e. $190 =$ _____ $\times 19$

f. $20,000 =$ _____ $\times 1,000$

Notes for parents :

- Let your child discover the pattern of zeroes when he/she multiply by 10, 100 and 1,000.

Learn Multiplying by multiples of 10, 100 and 1,000

Samy and his father are shopping at a music store. They are picking out some CDs to buy. The store displays their CDs in display racks. Each rack holds 300 CDs. How many CDs can 4 racks hold?



Multiply $4 \times 300 = n$

300 is a multiple of 100. When multiplying a multiple of 10, 100 or 1,000, you can use basic facts and patterns of zeroes to help you multiply.

$4 \times 3 = 12$ — basic fact.

$4 \times 30 = 120$ The product has the same number of zeroes as the factor. Unless the basic fact has a zero in the product.

$4 \times 300 = 1,200$

Solution Four racks can hold 1,200 CDs.

How to multiply by a multiple of 10, 100 or 1,000?

Multiply 6×700

Circle the fact.

6×700

Find the product.

42

Count the zeroes in the factors.

2

Write that number of zeroes

42 00

in the product.

Add commas, if needed.

4,200

In a short way,

$6 \times 700 = 4,200$

Diagram showing the basic fact 6 × 7 = 42, with arrows indicating the addition of two zeros to get 4,200.

Multiply $5 \times 9,000$

Circle the fact.

$5 \times 9,000$

Find the product.

45

Count the zeroes in the factors.

3

Write that number of zeroes

45 000

in the product.

Add commas, if needed.

45,000

In a short way,

$5 \times 9,000 = 45,000$

Diagram showing the basic fact 5 × 9 = 45, with arrows indicating the addition of three zeros to get 45,000.

* Let your child find the basic multiplication fact first. Then ask him/her to find the number of zeroes needed in the product and write the same number of zeroes to the right of the basic fact product.

Example 6

Use basic facts and patterns to find each product.

a. 5×7

5×70

5×700

$5 \times 7,000$

b. 9×6

9×60

9×600

$9 \times 6,000$

c. 5×8

5×80

5×800

$5 \times 8,000$

d. 9×40

e. 7×300

f. $8 \times 6,000$

Ask Yourself

- What basic fact can I use?
- How many zeroes should be in the product?

Solution



a. $5 \times 7 = 35$

$5 \times 70 = 350$

$5 \times 700 = 3,500$

$5 \times 7,000 = 35,000$

b. $9 \times 6 = 54$

$9 \times 60 = 540$

$9 \times 600 = 5,400$

$9 \times 6,000 = 54,000$

c. $5 \times 8 = 40$

$5 \times 80 = 400$

$5 \times 800 = 4,000$

$5 \times 8,000 = 40,000$

d. $9 \times 40 = 360$

e. $7 \times 300 = 2,100$

f. $8 \times 6,000 = 48,000$

Example 7

Fill in the blanks below.

a. $9 \times \underline{\hspace{2cm}} = 270$

c. $\underline{\hspace{2cm}} \times 6,000 = 18,000$

b. $\underline{\hspace{2cm}} \times 8 = 3,200$

d. $500 \times \underline{\hspace{2cm}} = 4,500$

Solution



a. $9 \times 30 = 270$

c. $3 \times 6,000 = 18,000$

b. $400 \times 8 = 3,200$

d. $500 \times 9 = 4,500$



Check

your understanding

Choose the correct answer.

a. What is 400×5 ?

A. 20

B. 200

C. 2,000

D. 20,000

b. $\underline{\hspace{2cm}} \times 5 = 250$

A. 5

B. 25

C. 50

D. 500

c. $300 \times \underline{\hspace{2cm}} = 1,800$

A. 6

B. 60

C. 600

D. 6,000

Notes for parents :

- Ask your child what basic fact can he/her use ? and how many zeroes should be in the product ?

Exercise 28

5-4 Commutative Property of Multiplication 5-5 Patterns of Multiplying by 10s 5-6 Review Exploring Patterns in Multiplication

REMEMBER

UNDERSTAND

APPLY

PROBLEM SOLVING

From the school book

1. Apply the Commutative Property of Multiplication to complete each equation.

a. $5 \times 7 = \underline{\hspace{2cm}} \times 5$

b. $20 \times \underline{\hspace{2cm}} = 6 \times 20$

c. $34 \times \underline{\hspace{2cm}} = 21 \times 34$

d. $6 \times 4 = 4 \times \underline{\hspace{2cm}}$

e. $23 \times 9 = \underline{\hspace{2cm}} \times 23$

f. $18 \times 7 = 7 \times \underline{\hspace{2cm}}$

g. $\underline{\hspace{2cm}} \times 15 = 15 \times 11$

h. $\underline{\hspace{2cm}} \times 3 = \underline{\hspace{2cm}} \times 9$

i. $4 \times \underline{\hspace{2cm}} = 5 \times \underline{\hspace{2cm}}$

j. $0 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \times 0$

2. Apply the Commutative Property of Multiplication to find the unknown value.

a. $33 \times 4 = 4 \times a$ $\underline{\hspace{2cm}}$

b. $b \times 9 = 9 \times 8$ $\underline{\hspace{2cm}}$

c. $a \times 7 = 7 \times 8$ $\underline{\hspace{2cm}}$

d. $5 \times 9 = 9 \times b$ $\underline{\hspace{2cm}}$

e. $16 \times a = 7 \times 16$ $\underline{\hspace{2cm}}$

f. $5 \times 93 = b \times 5$ $\underline{\hspace{2cm}}$

g. $16 \times k = 11 \times 16$ $\underline{\hspace{2cm}}$

h. $3 \times m = 100 \times 3$ $\underline{\hspace{2cm}}$

i. $4 \times n = 7 \times 4$ $\underline{\hspace{2cm}}$

j. $1 \times 4 = 4 \times a$ $\underline{\hspace{2cm}}$

3. Mental Math Number Talk Look at the problems below. Solve them mentally.

a. 5×1

b. 12×1

c. 672×1

d. 8×0

e. 16×0

f. 758×0

g. 0×230

h. 1×356

i. 0×43

4. What is the value of each of the following.

a. $5 \times 10 = \underline{\hspace{2cm}}$

b. $100 \times 5 = \underline{\hspace{2cm}}$

c. $3 \times 1,000 = \underline{\hspace{2cm}}$

d. $\underline{\hspace{2cm}} = 1,000 \times 2$

e. $700 = 7 \times \underline{\hspace{2cm}}$

f. $9 \times \underline{\hspace{2cm}} = 9,000$

g. $19,000 = \underline{\hspace{2cm}} \times 19$

h. $\underline{\hspace{2cm}} \times 10 = 50$

i. $17 \times \underline{\hspace{2cm}} = 1,700$

j. Challenge: $4 \times 10,000 = \underline{\hspace{2cm}}$

5. Use mental math to complete.

a. $8 \times 6 = \square$

$8 \times 60 = \square$

$8 \times 600 = \square$

$8 \times 6,000 = \square$

b. $4 \times 3 = \square$

$4 \times 30 = \square$

$4 \times 300 = \square$

$4 \times 3,000 = \square$

c. $6 \times 5 = \square$

$6 \times 50 = \square$

$6 \times 500 = \square$

$6 \times 5,000 = \square$

d. $5 \times 4 = \square$

$5 \times 40 = \square$

$5 \times 400 = \square$

$5 \times 4,000 = \square$

6. Use mental math. Write the basic fact and use a pattern to find the product.

a. 6×400

b. $7 \times 4,000$

c. 3×600

d. 5×600

e. $7 \times 6,000$

f. 6×90

g. $3 \times 7,000$

h. $3 \times 3,000$

7. Apply the strategies you have learned to solve the problems.

a. $900 \times 3 = \square$

c. $8,000 \times 5 = \square$

e. $500 \times \square = 3,500$

g. $\square \times 900 = 1,800$

i. $400 \times \square = 3,600$

b. $4 \times 40 = \square$

d. $600 \times 3 = 3 \times \square$

f. $6,000 \times \square = 24,000$

h. $\square \times 70 = 280$

j. $3 \times 500 = \square$

8. Match equal products.

$3,000 \times 5$

5×300

50×3

30×100


30×5

$3 \times 1,000$

$5 \times 3,000$

3×500

Story Problems


9.  Mr. Saleh has 24 beans. Write an equation using the commutative property of multiplication to describe two ways he can arrange his beans.

10. Bassem has 20 apples. write an equation using the commutative property of multiplication to describe two ways he can arrange the apples.



11. Noha has 18 stamps. Write an equation using the commutative property of multiplication to describe two ways she can arrange her stamps.



12.  Ahmed has 48 toy cars and wants to display them in his room. He wants to arrange them in equal rows and equal columns. How can he display his cars? Draw your solution.



13. The fastest man in the world is Usain Bolt. He can run about 44 kilometers per hour for short distances. One of the fastest cars in the world can move 10 times faster than Usain Bolt. What is the speed of this car?



Usain Bolt



Koenigsegg agera Rs

14. A music store displays CDs on racks. If each rack holds 200 CDs, how many CDs do 3 racks hold?

15. At the video game store, one display shelf holds 200 CDs. One display case holds 300 CDs. Which holds more CDs, 5 shelves or 3 cases? Explain your thinking.

16. At a computer super store, there are 40 display tables. Each table has 6 computer programs and 10 games. How many programs and games are there?

17. Write Math What's the Error?

Amal says that $5 \times 800 = 400$

Describe her error. Write the correct answer.



Challenge

18. Find each product.

a. 20×40

b. 30×500

c. $80 \times 2,000$

d. 600×200

Enrich your knowledge

Multiply 30×50

Use a basic fact to solve

Factors	Product
3×5	$= 15$ ← Basic fact
30×50	$= 1,500$
<div style="display: inline-block; text-align: center; vertical-align: middle;"> ↑ 1 zero </div> <div style="display: inline-block; text-align: center; vertical-align: middle;"> ↑ 1 zero </div>	<div style="display: inline-block; text-align: center; vertical-align: middle;"> ↑ 2 zeroes </div>



Multiple Choice Questions

Choose the correct answer.

1. $6 \times 5 = \quad \times 6$

- A. 6 B. 5
C. 4 D. 3

2. $34 \times 0 =$

- A. 1 B. 34
C. 0 D. 43

3. $1 \times 15 =$

- A. 1 B. 15
C. 0 D. 16

4. $51 \times 100 =$

- A. 5,100 B. 510
C. 51,000 D. 0

5. If $a \times 31 = 31 \times 9$, then $a =$

- A. 7 B. 40
C. 31 D. 9

6. $301 \times \quad = 30,100$

- A. 10 B. 100
C. 1,000 D. 0

7. $3 \times 500 =$

- A. 3,500 B. 15,000
C. 1,500 D. 800

8. $\quad \times 3,000 = 21,000$

- A. 7 B. 70
C. 700 D. 7,000

9. $6 \times \quad = 420$

- A. 7,000 B. 700
C. 70 D. 7

10. $20 \times 50 =$

- A. 100 B. 1,000
C. 10,000 D. 10

11. Determine which choice best shows the commutative property of multiplication.

- A. $3 \times 6 = 6 \times 3$ B. $3 \times 1 = 3$
C. $3 \times 60 = 180$ D. $3 \times 0 = 0$

12. Determine which choice best shows the identity property of multiplication.

- A. $0 \times 6 = 0$ B. $1 \times 6 = 6$
C. $1 \times 6 = 6 \times 1$ D. $2 \times 6 = 6 \times 2$

13. Determine which choice best shows the zero property of multiplication.

A. $1 \times 5 = 5$

B. $2 \times 3 = 3 \times 2$

C. $6 \times 100 = 600$

D. $0 \times 5 = 0$

14. Hany bought 3 mobiles, if the price of each one is 1,000 pounds, then the total price of them equal _____ pounds.

A. 3×100

B. 30

C. $1,000 \times 3$

D. $1,000 + 3$

15. The drama club is selling tickets for the school musical. There are 4 shows. They have 500 tickets for each show. How many tickets are there to sell?

A. 200 tickets

B. 1,000 tickets

C. 900 tickets

D. 2,000 tickets

Lesson 4

5-7 Exploring More Patterns in Multiplication

5-8 Applying Patterns in Multiplication

Learn Associative property in multiplication

Suppose you make Super Cheesy Sandwiches for 4 people. Each person gets 2 sandwiches. Each sandwich has 2 slices of cheese. How many slices of cheese will you need? Here are some ways to find the product of $4 \times 2 \times 2$.



Associative Property of Multiplication

Associative Property states that when you group factors in different ways, the product is the same.

Use parentheses to group the factors you multiply first.



$$(4 \times 2) \times 2 = \square$$

$$8 \times 2 = 16$$



$$4 \times (2 \times 2) = \square$$

$$4 \times 4 = 16$$

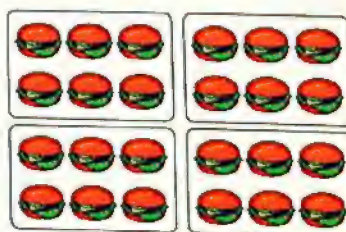
Another Example :

Here are some ways to find $4 \times 2 \times 3$



$$(4 \times 2) \times 3$$

$$8 \times 3 = 24$$



$$4 \times (2 \times 3)$$

$$4 \times 6 = 24$$

Math tip

If there are no grouping symbols, you can choose any two factors to multiply first.

$4 \times 2 \times 3$
Try 4×3 first
 $12 \times 2 = 24$

Notes for parents :

- Your child may forget to multiply by the third factor.

To check, ask your child to group the factors in a different way and multiply again.

Example 1

Solve each problem. Multiply the part in the parentheses first :

a. $(3 \times 2) \times 9$

b. $10 \times (5 \times 3)$

Solution 

a. $(3 \times 2) \times 9 = 6 \times 9 = 54$

b. $10 \times (5 \times 3) = 10 \times 15 = 150$

Example 2

Place parentheses to show one way to find the product. Then show another way to use parentheses to find the product.

a. $3 \times 2 \times 5$

b. $4 \times 10 \times 2$

Hint

If there are no parentheses, you can choose which pair of numbers to multiply first.

Solution 

a. $3 \times 2 \times 5 = (3 \times 2) \times 5$

$= 6 \times 5 = 30$

Or $3 \times 2 \times 5 = 3 \times (2 \times 5)$

$= 3 \times 10 = 30$

b. $4 \times 10 \times 2 = (4 \times 10) \times 2$

$= 40 \times 2 = 80$

Or $4 \times 10 \times 2 = 4 \times (10 \times 2)$

$= 4 \times 20 = 80$

Example 3

Apply the associative property of multiplication to solve the problems. Rewrite the factors in another order if helpful :

a. $3 \times 7 \times 2$

b. $4 \times 8 \times 2$

Hint

It is helpful to use commutative property to multiply the small factors first.

Solution 

a. $3 \times 7 \times 2 = 3 \times 2 \times 7$ [Commutative property]

$= (3 \times 2) \times 7$ [Associative property]

$= 6 \times 7 = 42$

b. $4 \times 8 \times 2 = 8 \times 4 \times 2$ [Commutative property]

$= 8 \times (4 \times 2)$ [Associative property]

$= 8 \times 8 = 64$

Notes for parents :

- After your child has reviewed the commutative property of multiplication, ask him/her to predict whether it would make a difference which two factors they multiplied first in $8 \times 4 \times 2$.

Example 4

Noha bought 5 packs of water bottles. Each pack had 4 rows of 8 bottles each.
How many water bottles did Noha buy?

**Solution**

$$\begin{aligned}\text{Noha bought} &= 5 \times 4 \times 8 \\ &= (5 \times 4) \times 8 \\ &= 20 \times 8 = 160 \text{ bottles.}\end{aligned}$$

Example 5

Use the grouping or associative property of multiplication and complete.

a. $(6 \times 2) \times 5 = 6 \times (\text{ } \times 5)$

b. $(20 \times \text{ }) \times 10 = 20 \times (15 \times 10)$

c. $7 \times (5 \times 2) = (7 \times \text{ }) \times 2$

d. $315 \times (16 \times 120) = (\text{ } \times \text{ }) \times 120$

Solution

a. $(6 \times 2) \times 5 = 6 \times (2 \times 5)$

b. $(20 \times 15) \times 10 = 20 \times (15 \times 10)$

c. $7 \times (5 \times 2) = (7 \times 5) \times 2$

d. $315 \times (16 \times 120) = (315 \times 16) \times 120$

check your understanding

1. Find each product.

a. $(4 \times 2) \times 6 =$ _____

b. $5 \times (5 \times 2) =$ _____

c. $8 \times 5 \times 2 =$ _____

d. $3 \times 2 \times 8 =$ _____

e. $2 \times 7 \times 4 =$ _____

2. Name two ways you can group $2 \times 5 \times 3$ to find the product.

Are the products the same? Explain.

• Ask your child, without multiplying, tell which is greater $(5 \times 7) \times 2$ or $(7 \times 2) \times 5$. Explain.

Learn Decomposing and associative property of multiplication

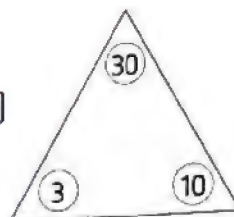
- You have learned before how to multiply by multiples of 10, 100 and 1,000 using a basic fact and a pattern of zeroes.
- Here you will use decomposing and associative property to solve problems.

Example 6

Find the product : 8×30

Solution 

$$\begin{aligned}
 8 \times 30 &= 8 \times [3 \times 10] && \text{[Decompose 30 to } 3 \times 10\text{]} \\
 &= [8 \times 3] \times 10 && \text{[Associative Property]} \\
 &= 24 \times 10 \\
 &= 240
 \end{aligned}$$



Another Way

$$\begin{aligned}
 8 \times 30 &= 240 \\
 &\swarrow \searrow \\
 24 &
 \end{aligned}$$

Example 7

Decompose each multiple of 10, 100 or 1,000 before multiplying.

Draw parentheses around the numbers you would multiply first, and then write the answer.

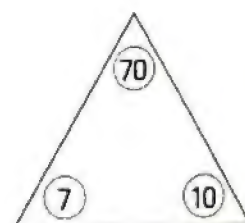
a. 2×70

b. 7×400

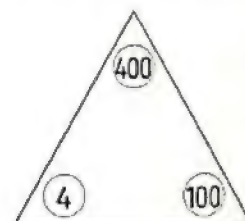
c. $4 \times 5,000$

Solution 

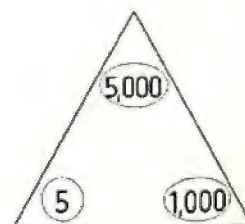
$$\begin{aligned}
 \text{a. } 2 \times 70 &= 2 \times [7 \times 10] \\
 &= [2 \times 7] \times 10 \\
 &= 14 \times 10 = 140
 \end{aligned}$$



$$\begin{aligned}
 \text{b. } 7 \times 400 &= 7 \times [4 \times 100] \\
 &= [7 \times 4] \times 100 \\
 &= 28 \times 100 = 2,800
 \end{aligned}$$



$$\begin{aligned}
 \text{c. } 4 \times 5,000 &= 4 \times [5 \times 1,000] \\
 &= [4 \times 5] \times 1,000 \\
 &= 20 \times 1,000 = 20,000
 \end{aligned}$$



Notes for parents :

- The product has the same number of zeroes as the number of zeroes in the factor with zeroes unless the basic fact has a zero.

Example 8

Solve using a strategy you prefer.

a. 9×60

b. 600×7

c. $4,000 \times 6$

Solution 

a. $9 \times 60 = 540$

Diagram: A bracket under 9 points down to 54. An arrow points from 54 up to 540. Another arrow points from 60 up to 540.

b. 600×7

Diagram: Three arrows point from the three zeros in 600 down to the two zeros in 4,200. An arrow points from 6 down to 42.

$600 \times 7 = 4,200$

Diagram: A bracket under 600 points down to 42. An arrow points from 42 up to 4,200.

c. $4,000 \times 6$

$= [1,000 \times 4] \times 6$

$= 1,000 \times [4 \times 6]$

$= 1,000 \times 24$

$= 24,000$

**Check** your understanding

Use decomposing and associative property to find each product.

a. $4 \times 40 =$ _____

b. $5 \times 500 =$ _____

c. $2 \times 8,000 =$ _____



* Let your child solve using strategy he/she prefer.

Exercise 29

5-7 Exploring More Patterns in Multiplication 5-8 Applying Patterns in Multiplication

REMEMBER

UNDERSTAND

APPLY

PROBLEM SOLVING

From the school book

1. Solve each problem. Multiply the part in the parentheses first. Show your work.

a. $[2 \times 3] \times 4 = \underline{\hspace{2cm}}$

c. $2 \times [3 \times 4] = \underline{\hspace{2cm}}$

e. $[2 \times 6] \times 3 = \underline{\hspace{2cm}}$

g. $[8 \times 5] \times 7 = \underline{\hspace{2cm}}$

i. $8 \times [6 \times 5] = \underline{\hspace{2cm}}$

b. $[5 \times 2] \times 3 = \underline{\hspace{2cm}}$

d. $5 \times [2 \times 3] = \underline{\hspace{2cm}}$

f. $9 \times [2 \times 3] = \underline{\hspace{2cm}}$

h. $6 \times [2 \times 4] = \underline{\hspace{2cm}}$

j. $[4 \times 5] \times 7 = \underline{\hspace{2cm}}$

2. Applying the associative property of multiplication to solve the problems.

a. $3 \times 2 \times 5 = \underline{\hspace{2cm}}$

c. $2 \times 9 \times 3 = \underline{\hspace{2cm}}$

e. $4 \times 2 \times 3 = \underline{\hspace{2cm}}$

g. $6 \times 5 \times 11 = \underline{\hspace{2cm}}$

i. $9 \times 5 \times 6 = \underline{\hspace{2cm}}$

b. $4 \times 6 \times 2 = \underline{\hspace{2cm}}$

d. $3 \times 2 \times 3 = \underline{\hspace{2cm}}$

f. $5 \times 4 \times 4 = \underline{\hspace{2cm}}$

h. $8 \times 4 \times 5 = \underline{\hspace{2cm}}$

j. $2 \times 5 \times 14 = \underline{\hspace{2cm}}$

3. Place parentheses to show one way to find the product. Then show one other way to use parentheses to find the product.

a. $5 \times 4 \times 2 = \underline{\hspace{2cm}}$

b. $3 \times 6 \times 2 = \underline{\hspace{2cm}}$

c. $2 \times 3 \times 4 = \underline{\hspace{2cm}}$

d. $8 \times 5 \times 10 = \underline{\hspace{2cm}}$

e. $5 \times 2 \times 3 = \underline{\hspace{2cm}}$

4. Write the missing number.

a. $[8 \times 4] \times 2 = 8 \times [\quad \times 2]$

c. $2 \times [6 \times 5] = [2 \times 6] \times \quad$

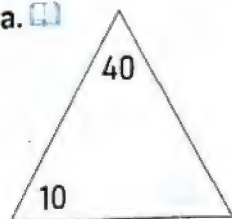
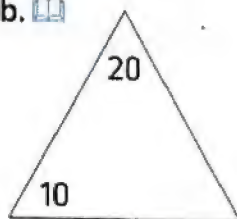
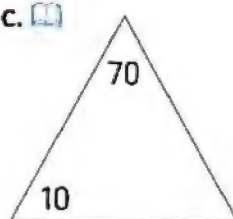
e. $5 \times 14 \times 2 = [5 \times \quad] \times 14$

b. $5 \times [10 \times 2] = [5 \times \quad] \times 2$

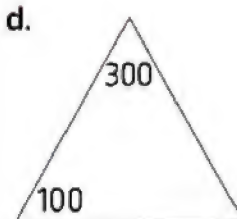
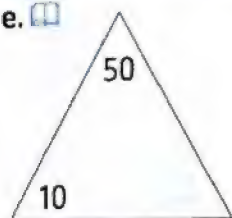
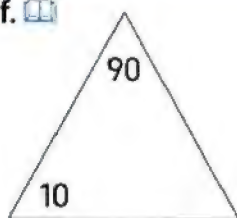
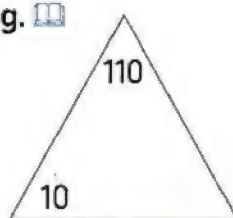
d. $[3 \times 9] \times 5 = \quad \times [9 \times 5]$

f. $3 \times 6 \times 2 = 6 \times [\quad \times 2]$

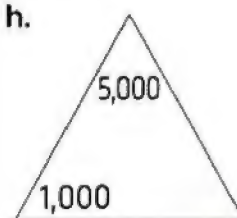
5. Write the missing factor in the box.

a. b. c. 

d.


e. f. g. 

h.



6. Write how many to make up each number.

a.  30 = _____ Tens

c.  160 = _____ Tens

e.  120 = _____ Tens

g. 600 = _____ Hundreds

i. 2,000 = _____ Thousands

b.  80 = _____ Tens

d.  140 = _____ Tens

f.  110 = _____ Tens

h. 5,000 = _____ Thousands

j. 900 = _____ Hundreds

7. Multiplying by multiples 10, 100 and 1,000 Use decomposing and the Associative Property of Multiplication to solve each problem.

a.  $7 \times 20 =$ _____

b.  $5 \times 50 =$ _____

c.  $4 \times 700 =$ _____

d.  $3 \times 4,000 =$ _____

e. $9 \times 500 =$ _____

f. $2 \times 3,000 =$ _____

g. $800 \times 7 =$ _____

h. $50 \times 8 =$ _____

8. Decompose each multiple of 10, 100 or 1,000 before multiplying. Draw parentheses around the numbers you would multiply first, and then write the answer.

a. $5 \times 70 =$ _____

b. $8 \times 30 =$ _____

c. $4 \times 40 =$ _____

d. $6 \times 600 =$ _____

e. $7 \times 7,000 =$ _____

9. Solve using a strategy you prefer.

a. $6 \times 90 =$ _____

b. $7,000 \times 6 =$ _____

c. $600 \times 4 =$ _____

d. $4,000 \times 5 =$ _____

e. $900 \times 3 =$ _____

10. Aisha bought 3 packs of water bottles. Each pack had 3 rows of 4 water bottles. How many water bottles did Aisha buy?



11. Ahmed has 5 packs of gum. Each pack has 6 pieces. If Mona has the same of Ahmed. How much gum do Mona and Ahmed have?



12. Hany works 20 hours a week. If he makes L.E. 6 per hour.
How much does Hany make in two weeks?

13. Angy runs 2 kilometers a day. If she runs five days a week.
How many kilometers does she run in 10 weeks?

14. Patric rides his bicycle 4 km per day. If he rides every day for three weeks.
How far will he ride?



15. Review each student's work. Then, answer the questions.

How is Heba's and Ashraf's work the same?
How are they different? Which student's strategy do you prefer? Why?

Heba's work

$$\begin{aligned} & [4 \times 8] \times 10 \\ & = 32 \times 10 \\ & = 320 \end{aligned}$$

Ashraf's work

$$\begin{aligned} & 4 \times [8 \times 10] \\ & = 4 \times 80 \\ & = 320 \end{aligned}$$

16. Writing about Math

- Use what you have learned about the Associative Property of Multiplication to help Farouk solve the problem. Use words and numbers to explain your thinking.

Farouk is trying to solve the problem $2 \times 7 \times 4$

He starts by solving 2×7 and gets 14. Place parentheses to show how Farouk started this problem. $2 \times 7 \times 4$

Next, he writes 14×4 but he does not know how to solve that multiplication problem.
Can you show Farouk another way to solve the problem?

Challenge

17. Marawan's mom gives him L.E. 5 every day for lunch at school. If he only pays L.E. 3 for lunch, how much will he save in 10 weeks if he goes to school five days weekly?

Multiple Choice Questions

Choose the correct answer.

1. $2 \times [5 \times 4] = [2 \times \text{---}] \times 4$

- A. 2 B. 4
C. 5 D. 40

2. $3 \times 50 = \text{---}$

- A. $3 \times 40 \times 10$ B. $3 + 50$
C. $3 \times 5 \times 0$ D. $3 \times 5 \times 10$

3. $3,000 \times 5 = \text{---}$

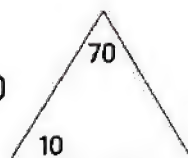
- A. 15,000 B. 35,000
C. 3,005 D. 1,500

4. $600 = \text{---}$ Hundreds

- A. 60 B. 600
C. 6 D. 60,000

5. The missing factor in the box equals ---

- A. 7,000 B. 70
C. 700 D. 7



6. $2 \times 3 \times 4 = \text{---}$

- A. 234 B. 9
C. 24 D. 10

7. $[2 \times 6] \times 3 = \text{---}$

- A. $2 \times [6 + 3]$
B. $[2 + 6] \times 3$
C. 63
D. 12×3

8. Marawan bought 5 packs of water bottles. Each pack had 2 rows of 4 water bottles. How many water bottles did Marawan buy?

- A. 8 B. 10
C. 40 D. 100

9. $5,000 \times 2 = \text{---}$

- A. 1,000 B. 2 Thousands
C. 10 Hundreds D. 10 Thousands

10. $[300 \times 7] \times 0 = \text{---}$

- A. 2,100 B. 3,070
C. zero D. 307

11. Khalid used the Associative Property to rewrite and correctly evaluate this expression:

$6,000 \times 7$

Which equation was most likely part of Khalid's work?

- A. $1,000 \times 13 = 1,300$ B. $1,000 \times 42 = 4,200$
C. $1,000 \times 13 = 13,000$ D. $1,000 \times 42 = 42,000$

Concept 2 Assessment | Unit 5



1. Put (✓) to the correct answer and (X) to the incorrect answer.

- a. $3 \times 8 = 8 \times 3$ is called a Commutative property of Addition. []
- b. The product of 1 and any number is the same number. []
- c. $1,000 \times 2 = 2$ Hundreds. []
- d. $(3 \times 5) \times 6 = 3 \times (5 \times 6)$. []
- e. $500 = 5$ Hundreds. []
- f. $5 \times 200 = 10$ Thousands. []

2. Choose the correct answer.

- a. $3 \times 7 = \underline{\hspace{2cm}} \times 3$
 A. 3 B. 7 C. 10 D. 37
- b. $29 \times 0 = \underline{\hspace{2cm}}$
 A. zero B. 29 C. 290 D. 209
- c. $345 \times \underline{\hspace{2cm}} = 345,000$
 A. 10 B. 100 C. 1,000 D. 1
- d. $3 \times 500 = \underline{\hspace{2cm}}$
 A. 3,500 B. $3 \times 5 \times 100$ C. 15×10 D. 15,000
- e. $(2 \times 3) \times 4 = \underline{\hspace{2cm}}$
 A. 234 B. 64 C. $(2 + 3) \times 4$ D. $2 \times (3 \times 4)$
- f. Which statement best describes the pattern of products created by multiplying one-digit whole numbers by 10 ?
 A. The product always has a 0 in the Ones place.
 B. The product always has a 0 in the Tens place.
 C. The product is always a three-digit number.
 D. The product is always a one-digit number.

3. Complete.

- | | |
|---|--|
| <ul style="list-style-type: none"> a. $4 \times 1,000 = \underline{\hspace{2cm}}$ c. $35 \times \underline{\hspace{2cm}} = \text{zero}$ e. $160 = \underline{\hspace{2cm}}$ Tens. | <ul style="list-style-type: none"> b. $\underline{\hspace{2cm}} \times 15 = 15 \times 11$ d. $(2 \times 3) \times 4 = \underline{\hspace{2cm}}$ f. $8 \times 300 = 8 \times 3 \times \underline{\hspace{2cm}}$ |
|---|--|

4. Compare. Write ($>$, $<$ or $=$).

a. $[5 \times 7] \times 2$ $5 \times [7 \times 2]$

b. $6 + 0$ 6×0

c. 15,000 150 Hundreds

d. 3×30 9×100

5. Find the unknown value.

a. $a \times 7 = 7 \times 8$

b. $4 \times n = 7 \times 4$

c. $[2 \times 7] \times 5 = 2 \times [b \times 5]$

d. $3 \times 500 = 3 \times 5 \times m$

6. Solve using a strategy you prefer.

a. $5,000 \times 6$

b. 4×80

7. Applying the associative property of multiplication to solve the problems.

a. $2 \times 9 \times 3$

b. $2 \times 5 \times 14$

8. Ashraf runs 3 kilometers a day. If he runs five days a week. How many kilometers does he run in 10 weeks?

9. Youssef has 20 apples. Write an equation using commutative property of multiplication to describe two ways he can arrange the apples.

10. Salwa bought 3 packs of water bottles. Each pack had 4 rows of 2 water bottles. How many water bottles did Salwa buy?

11. Solve mentally.

a. 12×1

b. 16×0

c. 0×758

d. 1×251

12. Solve each problem. Multiplying the part in the parentheses first.

a. $10 \times [6 \times 5]$

b. $[3 \times 2] \times 7$

c. $[24 \times 1] \times 0$

d. $[0 \times 971] \times 1$

Unit Five Assessment



1. put (✓) to the correct answer and (X) to the incorrect answer.

- a. 7 times greater than 2 is 14 []
- b. If $20 = A \times 4$, then $A = 16$ []
- c. The multiplicative comparison statement for

7	7	7	7	7	7
---	---	---	---	---	---

 is "35 is 5 times greater than 7" []
- d. $2 \times [7 \times 4] = [2 \times 7] \times 4$ []
- e. 7,000 = 7 Hundreds. []
- f. $3 \times 500 = 3 \times 5 \times 1,000$ []

2. Choose the correct answer.

- a. $5 \times 9 = 9 \times$ _____
 A. 5 B. 9 C. 14 D. 4
- b. $375 \times$ _____ $= 37,500$
 A. 10 B. 100 C. 1,000 D. 10,000
- c. $0 \times 25 =$ _____
 A. 25 B. 1 C. 0 D. 250
- d. Which equation would be the best to include in an explanation of the Commutative Property of Multiplication?
 A. $3 \times 5 = 5 \times 3$ B. $4 \times 16 = [4 \times 11] + [4 \times 5]$
 C. $[6 \times 4] \times 2 = 6 \times [4 \times 2]$ D. $5 \times 1 = 5$
- e. Which equation would be the best to include in an explanation of the Associative Property of Multiplication?
 A. $[9 \times 12] \times 0 = 0$ B. $[4 \times 6] \times 1 = 4 \times 6$
 C. $[3 \times 7] \times 2 = 3 \times [7 \times 2]$ D. $7 \times 6 = 6 \times 7$
- f. A box has 7 green balls. The box has 5 times as many as yellow balls as green balls. How many yellow balls are in the box?
 A. 12 B. 35 C. 2 D. 75

3. Complete.

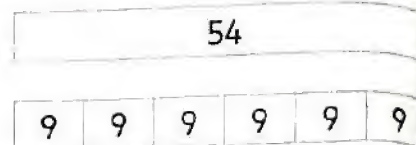
- a. 30 is _____ times greater than 6.
- b. The multiplicative equation of $8 + 8 + 8 + 8 + 8 = 40$ is _____
- c. $7 \times 100 =$ _____
- d. $3,200 =$ _____ Hundreds.
- e. _____ $\times 17 =$ zero
- f. If $A \times 7 = 21$, then $A =$ _____

4. Compare. Write ($>$, $<$ or $=$).

- a. 3×50 _____ $3 \times 5 \times 10$
- b. 14,000 _____ 14 Hundreds
- c. 7×5 _____ 5×7
- d. $3 + 0$ _____ 3×0

5. A model is shown.

Write an equation which is the best represented by this model.



6. Write the equation $3 + 3 + 3 + 3 = 12$ by using multiplication.

7. Sameh has 5 apples. His brother Maged has 20 apples. How many times more apples does Maged have ?

8. A hotel has 28 floors. The hotel has 7 times as many floors as the building next door. How many floors does the building next door have ?

9. Mina runs 5 kilometers a day. If he runs 6 days a week. How many kilometers does he run in 7 weeks ?

10. Manal has 30 pens. Write an equation using a Commutative Property of Multiplication to describe two ways she can arrange the pens.

11. Apply the properties of multiplication to solve the problems.

- a. $3 \times 2 \times 4$
- b. $5 \times 7 \times 2$

12. Find the unknown value.

- a. $7 \times 5,000 = 7 \times 5 \times a$
- b. $[3 \times 7] \times 6 = 3 \times [b \times 6]$
- c. $9 \times 4 = 4 \times m$
- d. $248 \times n =$ zero

Theme 2 | Mathematical Operations and Algebraic Thinking

UNIT
6

Factors and Multiples

» **Concept 1** : Understanding Factors

» **Concept 2** : Understanding Multiples



Fast Fact

Pandas are **BIG** eaters - every day they fill their tummies for up to 12 hours, shifting up to 12 kilograms of bamboo !
About how many kilograms of bamboo does a panda eat in 2 days, 3 days, 4 days, and a week ?

Concept

1

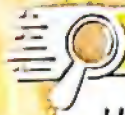
Understanding Factors



Concept Overview

In concept 1:

Understanding Factors, students explore the concept of factors. They use their knowledge of multiplication facts, observation of patterns in skip counting, and number sense to build critical understanding of the relationship between numbers and their factors. They identify factors, common factors, and greatest common factors between two numbers. This work prepares them for working with larger numbers and fractions.



Fast Fact

Hippos are considered the second largest land animal on Earth (first place goes to the elephant!). Males measures 1 m and a half tall, and can weigh up 3,200 kg. That's as much as three small cars !

Lesson No.	Lesson Name	Vocabulary Terms	Learning Objectives
Lesson 1	6-1 Identifying Factors of Whole Numbers	Factor – Factor pairs	<ul style="list-style-type: none">• Students will define factors of a whole number.• Students will find all factors of a given number between 0 and 100.• Students will explain patterns they observe in numbers that have 2, 5 or 10 as factors.
	6-2 Prime and Composite Numbers	Composite – Factors – Prime	<ul style="list-style-type: none">• Students will find all factors of a given number between 0 and 100.• Students will explain patterns they observe in numbers that have 3, 6 or 9 as factors.• Students will determine if a number is prime or composite.
Lesson 2	6-3 Greatest Common Factor	Common factor – Factor – Greatest common factor (GCF)	<ul style="list-style-type: none">• Students will find common factors between two whole numbers.• Students will identify the greatest common factor between two whole numbers.

Lesson 1

6-1 Identifying Factors of Whole Numbers 6-2 Prime and Composite Numbers

Learn Identify factors of whole numbers

A **factor** is a number multiplied by another number to get a product.

► Examples :

$2 \times 9 = 18$	$1 \times 7 = 7$	$3 \times 10 = 30$
↓ ↑ ↑	↓ ↑ ↑	↓ ↑ ↑
factor × factor = Product	factor × factor = Product	factor × factor = Product

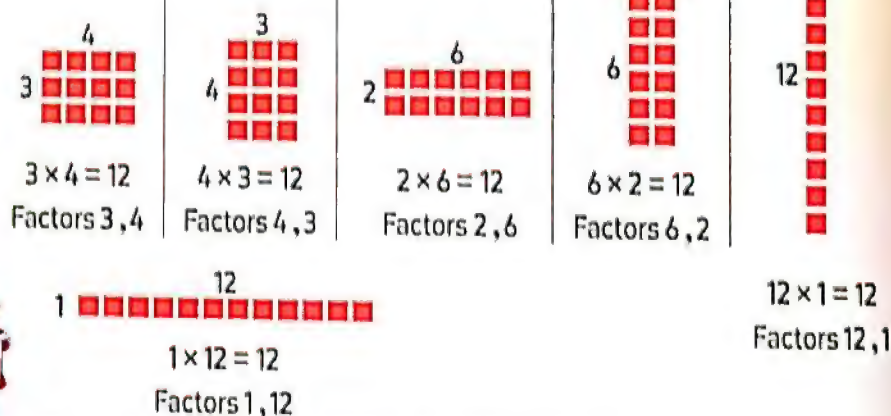
Many numbers can be broken into factors in different ways.

Arrays. $16 = 4 \times 4$ $16 = 2 \times 8$ $16 = 1 \times 16$

Enas has 12 pots of flowers for her box garden.

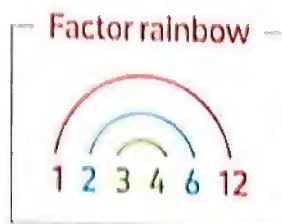
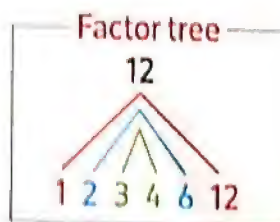
How many ways can she arrange them in equal rows?

Make all the arrays you can with 12 tiles to show all the factors of the number 12.



So, Enas can arrange her pots in 6 different ways.

The factors of 12 are 1, 2, 3, 4, 6 and 12. There are 6 factors or 3 factor pairs.



Factor T-chart

1	12
2	6
3	4

Notes for parents :

- Let your child find the factors of 15. Ask him/her to draw arrays to help finding factors and help him/her show the factors by factor tree, factor rainbow and factor T-chart.

Example 1

Make as many arrays as you can to show all factors of 36. Show the factors on factor tree, factor rainbow, and factor T-chart.

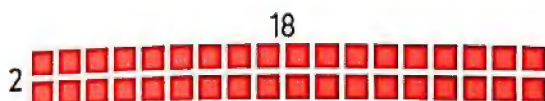
Solution 

$$1 \times 36 = 36$$



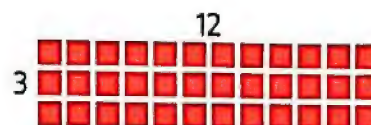
This array has a length of 36 and a width of 1. So, 36 and 1 are factors of 36.

$$2 \times 18 = 36$$



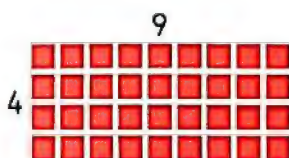
This array has a length of 18 and a width of 2. So, 18 and 2 are factors of 36.

$$3 \times 12 = 36$$



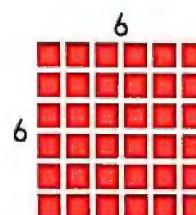
This array has a length of 12 and a width of 3. So, 12 and 3 are factors of 36.

$$4 \times 9 = 36$$



This array has a length of 9 and a width of 4. So, 9 and 4 are factors of 36.

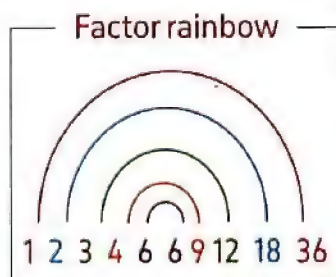
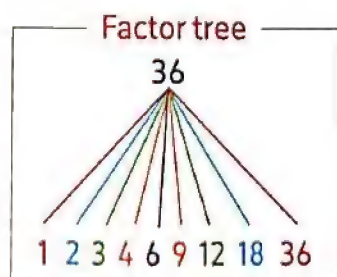
$$6 \times 6 = 36$$



This array has a length of 6 and a width of 6. So, 6 and 6 are factors of 36.

So, The factors of 36 are 1, 2, 3, 4, 6, 9, 12, 18 and 36.

Are there other ways the arrays can be formed and still show the same factors? Explain.



Factor T-chart

1	36
2	18
3	12
4	9
6	6

• Reinforce your child understanding by finding more factors of numbers.

How can you find all the factors of a number ?

Helpfull Hint :

1	Is a factor of any number. Every number will have a factor pair of 1 and itself.	Examples
2	Is a factor, if the digit in the ones place is even [The ones digit is : 0, 2, 4, 6 or 8].	8, 24, 48
3	Is a factor, if the sum of the digits is a number that exists when skip counting by 3s.	9, 18, 24
4	Is a factor, if the number is existing when skip counting by 4s.	8, 12, 16
5	Is a factor, if the ones digit is 0 or 5.	5, 15, 20
6	Is a factor, if the number is even and has a factor 3.	12, 18, 24
9	Is a factor, if the sum of the digits is a number that exists when skip counting by 9s.	9, 27, 45
10	Is a factor, if the ones digit is 0.	20, 50, 100

Example 2

Answer the following questions.

- Is 3 a factor of 29 ? Explain how do you know.
- Is 9 a factor of 54 ? Explain how do you know.
- Is 6 a factor of 48 ? Explain how do you know.

Solution

- No, because $2 + 9 = 11$ and 11 is a number does not exist when skip counting by 3s.
- Yes, because $5 + 4 = 9$ and 9 is a number existing when skip counting by 9s.
- Yes, because 48 is even and $4 + 8 = 12$ and 12 is a number existing when skip counting by 3s.

Notes for parents :

- Ask your child more questions of factors such as : Is 2 a factor of 14 ? Is 5 a factor of 61 ? and more questions, then let your child explain how did he/she know.

Example 3

Find all the factors of 48.

Solution 

To find all the factors of a number, make an organized list of multiplication sentences. Write sentences until your factors start to repeat. (Ignore any sentences that won't work). Then list the factors. **Find all the factors of 48.**

$$48 = 1 \times 48 \text{ (1 is a factor of every whole number)}$$

$$2 \times 24 \text{ (48 is even)}$$

$$3 \times 16 \text{ (4 + 8 = 12 and 12 is existing when skip counting by 3s.)}$$

$$4 \times 12 \text{ (48 is existing when skip counting by 4s.)}$$

$$\text{—} 5 \times \text{—}$$

$$6 \times 8 \text{ (48 is even, and 3 is a factor)}$$

$$\text{—} 7 \times \text{—}$$

$$8 \times 6 \text{ (← STOP! Repeat of } 6 \times 8 \text{).}$$

The factors of 48 are 1, 2, 3, 4, 6, 8, 12, 16, 24 and 48. There are 5 factor pairs.

 **Check** your understanding

1. Find the factors of 15 and show the factors on factor tree, factor rainbow and factor T-chart.

2. Choose the correct answer.

a. 5 is a factor of _____

A. 50

B. 51

C. 52

D. 53

b. Which number is a factor of 20? _____

A. 6

B. 10

C. 30

D. 40

c. The number 11 has _____ factors.

A. 2

B. 3

C. 4

D. 5

d. The number 32 has _____ factors.

A. 4

B. 6

C. 8

D. 10

e. Which is the factor of every number? _____

A. 0

B. 1

C. 2

D. 10

• Ask your child to find all the factors of 72 by using the helpful hint to check all the factors.

Learn Prime and composite numbers

You can use the factors of a number to tell if it is a prime number or a composite number.

▶ A **Prime number** is a whole number that has exactly two different factors, 1 and itself.

▶ **Example :**

5 is an example of a prime number. It has only two different factors, 1 and 5. It has only one rectangular array.

■ ■ ■ ■ ■ $1 \times 5 = 5$

▶ **More examples of prime numbers**

17, 29, 31

Number	Factors
17	1, 17
29	1, 29
31	1, 31

▶ A **Composite number** is a whole number greater than 1 that has more than two factors.

▶ **Example :**

6 is an example of a composite number. Its factors are 1, 2, 3 and 6. It has more than one rectangular array.

■ ■ ■ ■ ■ ■ $1 \times 6 = 6$

■ ■ ■ ■ $2 \times 3 = 6$

▶ **More examples of composite numbers**

15, 18, 25

Number	Factors
15	1, 3, 5, 15
18	1, 2, 3, 6, 9, 18
25	1, 5, 25

Remarks

- The number 1 is neither prime nor composite because it has only ONE factor.
- 2 is the smallest prime number.
- All prime numbers are odd numbers except 2.
- The following table shows the prime numbers which lie between 1 and 100 :

2	3	5	7	11	13	17	19	23
29	31	37	41	43	47	53	59	61
	67	71	73	79	83	89	97	

Notes for parents :

- Use the 100-chart to check the prime and the composite numbers and let your child identify how he/she knew the difference between them.

Example 4

Check each of the following numbers if it is a prime or a composite number.

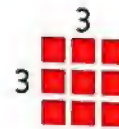
a. 9

b. 13

c. 19

Solution 

a. 9 has more than two factors [1, 3, 9]



So, 9 is a composite number.

b. 13 has exactly two different factors 1, 13



So, 13 is a prime number.

c. 19 has exactly two different factors 1, 19



So, 19 is a prime number.

Check your understanding

Choose the correct answer.

a. _____ is a prime number.

A. 9

B. 16

C. 19

D. 21

b. _____ is a prime number.

A. 1

B. 6

C. 7

D. 12

c. _____ isn't a prime number.

A. 1

B. 3

C. 5

D. 7

d. _____ is a composite number.

A. 1

B. 3

C. 13

D. 15

e. _____ isn't a composite number.

A. 11

B. 12

C. 14

D. 20

f. The smallest prime number is _____

A. 0

B. 1

C. 2

D. 3

g. The smallest odd prime number is _____

A. 0

B. 1

C. 2

D. 3

h. The prime number between 44 and 50 is _____

A. 45

B. 46

C. 47

D. 49

* Give your child a group of numbers and ask him/her to identify the prime numbers and the composite numbers.

Exercise 30

6-1 Identifying Factors of Whole Numbers 6-2 Prime and Composite Numbers

REMEMBER

UNDERSTAND

APPLY

PROBLEM SOLVING

From the school book

First : Exercises on factors

1. Draw arrays for each number to show all the factors.

a. 9

b. 16

c. 24

d. 30

2. Determine if the given number has 2 as a factor, 5 as a factor, or 10 as a factor. Circle yes or no.

	Number	Is 2 a factor?		Is 5 a factor?		Is 10 a factor?	
a.	70	Yes	No	Yes	No	Yes	No
b.	15	Yes	No	Yes	No	Yes	No
c.	26	Yes	No	Yes	No	Yes	No
d.	17	Yes	No	Yes	No	Yes	No

3. Highlight or circle the factors of the numbers listed.

a. 15: 2 5 10
 c. 12: 2 5 10
 e. 36: 2 5 10

b. 30: 2 5 10
 d. 25: 2 5 10

4. Circle the factors of the numbers listed.

a. 16: 1 2 3 4 5 6 7 8 9 10
 b. 20: 1 2 3 4 5 6 7 8 9 10
 c. 28: 1 2 3 4 5 6 7 8 9 10
 d. 56: 1 2 3 4 5 6 7 8 9 10
 e. 63: 1 2 3 4 5 6 7 8 9 10

5. Complete with "is a factor of" or "is not a factor of":

a. 7 _____ 14
 c. 2 _____ 100
 e. 6 _____ 96
 g. 4 _____ 88
 i. 19 _____ 19

b. 5 _____ 52
 d. 3 _____ 36
 f. 1 _____ 67
 h. 9 _____ 27
 j. 8 _____ 40

6. Answer the following problems.

a. Is 2 a factor of 23? How do you know?

b. Is 5 a factor of 35? How do you know?

c. Is 6 a factor of 84? How do you know?

d. Is 3 a factor of 53? How do you know?

e. Is 4 a factor of 32? How do you know?

f. Is 7 a factor of 48? How do you know?

g.  Is 9 a factor of 63? How do you know?

h. Is 1 a factor of 57? How do you know?

i. Is 8 a factor of 64? How do you know?

7. Complete the following.

a. $8 = 1 \times \underline{\hspace{2cm}} = 2 \times \underline{\hspace{2cm}}$

The factors are:

c. $20 = 1 \times \underline{\hspace{2cm}} = 2 \times \underline{\hspace{2cm}} = 4 \times \underline{\hspace{2cm}}$

The factors are:

e. $42 = 1 \times \underline{\hspace{2cm}} = 2 \times \underline{\hspace{2cm}} = 3 \times \underline{\hspace{2cm}} = 6 \times \underline{\hspace{2cm}}$

The factors are:

f. $100 = 1 \times \underline{\hspace{2cm}} = 2 \times \underline{\hspace{2cm}} = 4 \times \underline{\hspace{2cm}} = 5 \times \underline{\hspace{2cm}} = 10 \times \underline{\hspace{2cm}}$

The factors are:

b. $25 = 1 \times \underline{\hspace{2cm}} = 5 \times \underline{\hspace{2cm}}$

The factors are:

d. $33 = 1 \times \underline{\hspace{2cm}} = 3 \times \underline{\hspace{2cm}}$

The factors are:

8. Find all the factors of the following and create a factor tree, a factor rainbow and a factor T-chart.

a. 12. There are 3 factor pairs.

Factors are:

Factor tree	Factor rainbow	Factor T-chart

- b. 20. There are 3 factor pairs.

Factors are : _____

Factor tree	Factor rainbow	Factor T-chart

- c. 40. There are 4 factor pairs.

Factors are : _____

Factor tree	Factor rainbow	Factor T-chart

- d. 36. There are 5 factor pairs.

Factors are : _____

Factor tree	Factor rainbow	Factor T-chart

9. List all the factors of each number. You may create a factor tree, a factor rainbow or a factor T-chart.

a. 14 _____

c. 38 _____

e. 54 _____

g. 48 _____

i. 13 _____

k. 49 _____

b. 16 _____

d. 25 _____

f. 21 _____

h. 19 _____

j. 35 _____

l. 64 _____

10. Factor Riddles. Guess the number:

- a. The number is an even number between 1 and 10. Some of its factors include 1, 2 and 3. What number is it ?

- b. The number is an even number between 20 and 30. Some of its factors include 1, 2, 4, 7 and 14. What number is it ?

- c. The number is an even number greater than 10. It has 10 as a factor. It is less than 30. What number is it ?

- d. The number is an even number greater than 40. It has 10 as a factor. It is less than 60. What number is it ?

- e. The number is a two-digit number. It has 3 as a factor. Its tens digit is less than its ones digit. One of its factor pairs is 4 and 6. What number is it ?

- f. The number is a two-digit number. It has 5 as a factor. Its tens digit is less than its ones digit. One of its factor pairs is 5 and 7. What number is it ?

11. Writing About Math : Write three numbers that have 2, 5 and 10 as factors.

What do the three numbers you wrote have in common ?

Second : Exercises on prime and composite numbers

12. Complete with "Prime" or "Composite".

- | | | | |
|----------|----------|----------|----------|
| a. 2 is | b. 4 is | c. 29 is | d. 3 is |
| e. 5 is | f. 6 is | g. 7 is | h. 11 is |
| i. 13 is | j. 12 is | k. 16 is | l. 23 is |

13. Complete.

- _____ is the only even prime number.
- The prime number has two different factors which are _____ and _____.
- The 2-digit prime number which is less than 13 is _____.
- The prime numbers between 60 and 70 are _____.
- The number 37 has _____ factors and it is a _____ number.
- The number 15 is a _____ number because it has _____ factors.

14. List all the factors of each number. Then, write if the number is prime or composite.

- | | |
|--------------|--------------|
| a. 14 _____ | b. 19 _____ |
| c. 23 _____ | d. 37 _____ |
| e. 18 _____ | f. 32 _____ |
| g. 21 _____ | h. 45 _____ |
| i. 50 _____ | j. 59 _____ |
| k. 22 _____ | l. 61 _____ |
| m. 31 _____ | n. 46 _____ |
| o. 44 _____ | p. 29 _____ |

15. Prime Numbers less than 100. Identify all of the prime numbers less than 100.

Use skip counting and factor patterns to help you eliminate composite numbers.

- Circle 2 and cross out all other numbers that you say when you skip count by 2s.
- Circle 3 and cross out all other numbers that you say when you skip count by 3s.
- Circle 5 and cross out all other numbers that you say when you skip count by 5s [some are already crossed out].
- Circle 7 and cross out all other numbers that you say when you skip count by 7s.

91	92	93	94	95	96	97	98	99	100
81	82	83	84	85	86	87	88	89	90
71	72	73	74	75	76	77	78	79	80
61	62	63	64	65	66	67	68	69	70
51	52	53	54	55	56	57	58	59	60
41	42	43	44	45	46	47	48	49	50
31	32	33	34	35	36	37	38	39	40
21	22	23	24	25	26	27	28	29	30
11	12	13	14	15	16	17	18	19	20
1	2	3	4	5	6	7	8	9	10

- Circle all numbers that remain except for 1.
When you are finished, the circled numbers are prime and the crossed out numbers are composite.

16. **Writing About Math.** How do you decide if a number is prime or composite?

17. **What's the Error.** Ashraf listed the first five prime numbers as 2, 3, 7, 11 and 13.
Describe his error. Write the correct answer.

18. **Writing About Math.** The seats on the new ferry will be arranged in a rectangle. Is it better for the ferry to have 48 seats or 53 seats? How do you know? Would 49 seats be a good idea? Use numbers, words and pictures to explain your thinking.

Challenge

19. Write all prime numbers which are less than 30
20. Write all prime numbers which are between 46 and 62
21. Write all composite numbers which are between 5 and 23



Multiple Choice Questions

Choose the correct answer:

- | | |
|--|--|
| 1. All the factors of 25 are _____
A. 1, 5, 20 B. 1, 20, 25
C. 5, 20, 25 D. 1, 5, 25 | 2. All the factors of _____ are 1, 2, 3, 6, 9 and 18
A. 9 B. 18 C. 36 D. 54 |
| 3. 4 is a factor of _____
A. 37 B. 38
C. 39 D. 40 | 4. _____ is a factor of 20
A. 3 B. 5
C. 8 D. 40 |
| 5. Which of the following is a factor of 10? _____
A. 30 B. 20 C. 15 D. 5 | 6. The factor pair 3 and 8 is for the number _____
A. 5 B. 11 C. 12 D. 24 |
| 7. The factor pair _____ is for the number 21
A. 2 and 10 B. 2 and 1
C. 3 and 7 D. 5 and 4 | 8. 23 has _____ factor pair.
A. 1 B. 2
C. 3 D. 4 |
| 9. 18 has _____ factors.
A. 2 B. 4 C. 6 D. 8 | 10. Which of the following is a prime number? _____
A. 1 B. 3 C. 9 D. 15 |
| 11. Which of the following is a composite number? _____
A. 1 B. 31 C. 33 D. 43 | 12. Which of the following is NOT a prime number? _____
A. 2 B. 5 C. 7 D. 9 |
| 13. All the following numbers are composite except _____
A. 66 B. 67
C. 68 D. 69 | 14. Which statement is true? _____
A. 1 is a factor of only odd numbers.
B. 1 is not a factor of any number.
C. 1 is a factor of every number.
D. 1 is a factor of only 0. |

Lesson 2

6-3 Greatest Common Factor

Learn

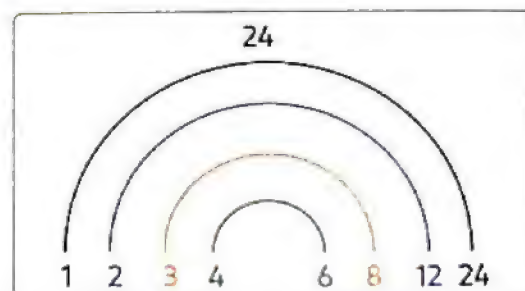
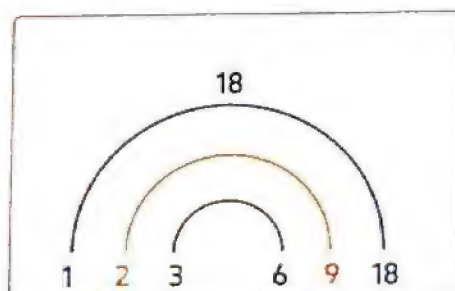
A scientist is setting up some study tanks. She has collected 18 identical fish and 24 identical plants. She wants all tanks to be alike and contain as many fish and plants as possible. What is the greatest number of tanks she can set up?



Think : How can you find the common factors for 18 and 24

The greatest number of tanks she can set up is the greatest common factor of 18 and 24.

- **Common factors** of two numbers are factors that are the same.
- The **greatest common factor [GCF]** of two numbers is the greatest number that is a factor of both.



- Factors of 18 : 1, 2, 3, 6, 9, 18
- Factors of 24 : 1, 2, 3, 4, 6, 8, 12, 24
- Common factors : 1, 2, 3, 6
- The greatest common factor [GCF] : 6

So, the greatest number of tanks is 6 tanks of 3 fish and 4 plants in each tank.

$$18 \div 6 = 3$$

$$24 \div 6 = 4$$

Notes for parents :

- Tell your child that common factors and greatest common factors are helpful to solve many problems in life.

Example

Find all the common factors and GCF of each pair.

a. 12 and 15

b. 16 and 28

c. 7 and 11

Solution 

a. 12: 1, 2, 3, 4, 6, 12

15: 1, 3, 5, 15

Common factors: 1, 3

GCF: 3

Factors of 12		Factors of 15	
①	12	①	15
2	6	③	5
③	4		

b. 16: 1, 2, 4, 8, 16

28: 1, 2, 4, 7, 14, 28

Common factors: 1, 2, 4

GCF: 4

Factors of 16		Factors of 28	
①	16	①	28
②	8	②	14
④	4	④	7

c. 7: 1, 7

11: 1, 11

Common factor: 1

GCF: 1

Note that :

- 1 is the common factor of all whole numbers.
- All prime numbers has one common factor that is 1. Such as 7 and 11.

Check your understanding

Find all the common factors and GCF of:

a. 9 and 12

b. 25 and 15

* Give your child two numbers and let him/her find the common factors and the GCF of them such as (5 and 17), (4 and 12).

Exercise 31

6-3 Greatest Common Factor

REMEMBER

UNDERSTAND

APPLY

PROBLEM SOLVING

From the school book

1. List the factors of each number. Highlight or circle the common factors of each pair of numbers.

a. 16 and 20

Factors of 16: _____

Factors of 20: _____

b. 18 and 4

Factors of 18: _____

Factors of 4: _____

c. 20 and 30

Factors of 20: _____

Factors of 30: _____

d. 17 and 22

Factors of 17: _____

Factors of 22: _____

e. 21 and 35

Factors of 21: _____

Factors of 35: _____

f. 36 and 42

Factors of 36: _____

Factors of 42: _____

2. List the common factors of the given numbers.

- a. 4 and 12 _____
- b. 10 and 35 _____
- c. 17 and 34 _____
- d. 18 and 24 _____
- e. 25 and 30 _____
- f. 22 and 44 _____
- g. 66 and 33 _____
- h. 45 and 63 _____
- i. 19 and 23 _____

3. Find the common factors and the greatest common factor (GCF) of :

- a. 4 and 6

Factors of 4 : _____

Factors of 6 : _____

Common factors : _____ GCF : _____

- b. 10 and 30

Factors of 10 : _____

Factors of 30 : _____

Common factors : _____ GCF : _____

- c. 40 and 45

Factors of 40 : _____

Factors of 45 : _____

Common factors : _____ GCF : _____

d. 54 and 18

Factors of 54: _____

Factors of 18: _____

GCF: _____

Common factors: _____

e. 48 and 60

Factors of 48: _____

Factors of 60: _____

GCF: _____

Common factors: _____

4. Find the GCF of the given numbers.

a. 8 and 16

b. 12 and 18

c. 40 and 50

d. 10 and 45

e. 10 and 24

f. 45 and 81


g. 40 and 48


h. 33 and 11

5. Use what you know about factors and common factors to solve each problem.


- a. Sylvia has 21 pencils and 14 erasers. She wants to put them in groups. What is the greatest number of groups that can be made so that each group has the same number of items? How many pencils will be in each group? How many erasers will be in each group?

- b. There are 40 girls and 32 boys who want to participate in lap on teams. If each team must have the same number of girls and the same number of boys, what is the greatest number of teams that can participate? How many girls will be in each team? How many boys will be in each team?

- c.  A class is going on a field trip. There are 36 girls and 27 boys in the class. Students will be divided into groups of girls and boys. What is the greatest number of groups that can be made so that each group has the same number of children? How many children will be in each group of boys? How many children will be in each group of girls?

- d.  Mohab is making flower arrangements. He has 7 roses and 14 daisies. If Mohab wants to make all the arrangements identical and have no flowers left over, what is the greatest number of flower arrangements that he can make? How many roses and how many daisies will be in each flower arrangement?

- e. Eslam has 60 blue marbles and 24 red marbles. If he wants to place them in identical groups without any marbles left over, what is the greatest number of groups Eslam can make? How many blue marbles and how many red marbles will be in each group?

- f.  Amira and her friends are going on a picnic. Amira wants to make snack packs of apples and candy to take on the picnic. She has 24 apples and 36 small bags of candy. What is the greatest number of snack packs Amira can make if each pack must have exactly the same number of apples and exactly the same number of bags of candy with no snacks left over? How many apples will be in each snack pack? How many bags of candy will be in each snack pack?
-
-
-

- g. For a dinner party, Adam is creating individual servings. He has 28 pieces of fruit and 14 yogurt cups. If he wants each serving to be identical with no food left over, what is the greatest number of servings Adam can create? How many pieces of fruit and how many yogurt cups will be in each serving?
-
-
-



Challenge

6. Find the GCF of 15, 18 and 21.



7. Find two numbers that have 6 as the greatest common factor.



8. The common factors of two numbers are 1 and 3.



The two numbers could be 9 and 21 or 3 and 6. Explain how.



Multiple Choice Questions

Choose the correct answer.

- | | |
|---|---|
| 1. Which of the following are the common factors of 4 and 6?
A. 1 and 2
B. 1 and 3
C. 2 and 3
D. 3 and 4 | 2. Which of the following are the common factors of 15 and 25?
A. 1 and 3
B. 1 and 5
C. 1 and 15
D. 1 and 25 |
| 3. The GCF of 18 and 27 is
A. 1
B. 3
C. 6
D. 9 | 4. The GCF of 20 and 30 is
A. 1
B. 4
C. 5
D. 10 |
| 5. The common factor of all numbers is
A. 0
B. 1
C. 2
D. 3 | 6. 1 and 7 are the common factors of
A. 2 and 7
B. 2 and 14
C. 7 and 12
D. 7 and 14 |
| 7. Which two numbers are common factors of 48 and 54?
A. 2
B. 6
C. 8
D. 9
E. 12
F. 24 | 8. Which two numbers are common factors of 27 and 63?
A. 2
B. 3
C. 4
D. 7
E. 9
F. 11 |
| 9. Which pair of numbers has the same greatest common factor as 42 and 12?
A. 9 and 6
B. 8 and 24
C. 16 and 60
D. 18 and 30 | 10. Which pair of numbers has the same greatest common factor as 84 and 96?
A. 8 and 12
B. 24 and 36
C. 45 and 60
D. 6 and 54 |
11. Which phrase defines common factors between two numbers, such as 16 and 28?
- A. The factors of each number 16 and 28, listed with the greatest factor found on both lists circled.
 - B. The factors of each number 16 and 28, listed with the same factors found on both lists circled.
 - C. The factors of each number 16 and 28, listed with the smallest factor found on both lists circled.
 - D. The factors of each number 16 and 28, listed with the differing factors found on both lists circled.

Concept 1 Assessment | Unit 6



1. Choose the correct answer.

- Which of the following numbers is a prime number?
A. 1 B. 11 C. 14 D. 50
- The number _____ its all factors are 1, 2, 4, 8 and 16
A. 8 B. 12 C. 16 D. 32
- The factors of 27 are _____
A. 1, 3, 9 B. 1, 3, 27 C. 1, 3, 9, 27 D. 1, 3, 7, 9, 27
- The number 13 has _____ factors.
A. 1 B. 2 C. 3 D. 4
- The factor pair _____ is for the number 35.
A. 2 and 17 B. 5 and 4 C. 5 and 7 D. 4 and 7
- The GCF of 48 and 56 is _____
A. 6 B. 8 C. 9 D. 12

2. Complete the following.

- _____ is the only even prime number.
- The common factors of 30 and 21 are _____ and the GCF is _____
- $48 = 1 \times \text{_____} = 2 \times \text{_____} = 3 \times \text{_____} = 4 \times \text{_____} = 6 \times \text{_____}$
The all factors are : _____
- The number 25 is a _____ number because it has _____ factors.
- The number 32 has _____ factor pairs.
- The composite numbers between 1 and 10 are _____

3. Write (✓) or (X).

- The GCF of 36 and 12 is 6 []
- The number 47 is a prime number. []
- The all factors of 28 are 1, 2, 3, 4, 7, 14, 28 []
- The common factors of 12 and 16 are 1, 2, 4 []

e. The number 22 is a composite number.

[]

f. All odd numbers are prime numbers.

[]

4. Match each pair of numbers with their greatest common factor (GCF).

a. 60 and 45

1. 9

b. 20 and 40

2. 12

c. 81 and 45

3. 15

d. 84 and 36

4. 20

5. List all the factors of each number. You may create a factor tree, factor rainbow or factor T-chart.

a. 12

b. 25

c. 54

6. Is 9 a factor of 81? How do you know?

7. The number is an even number greater than 50 and less than 70. It has 10 as a factor. What is the number?

8. Find the common factors and the greatest common factor (GCF) of each pair of the following.

a. 10 and 14

b. 11 and 33

c. 25 and 36

9. Is 19 a prime number? How do you know?

10. Are the numbers that have 4 as a factor also have 2 as a factor? How do you know?

11. What factor pair does every number have?

12. A farmer is making fruit arrangements. He has 48 oranges and 80 apples. If he wants to put them in identical groups without any fruit left over, what is the greatest number of groups he can make? How many oranges and how many apples will be in each group?

Concept

2

Understanding Multiples





Fast Fact

*Believe it or not,
Koalas can sleep up
to 18 hours a day!
How many hours do
they sleep per week?*

Concept Overview

In concept 2:

Understanding Multiples, students explore the concept of multiples. As with factors, they use their knowledge of multiplication facts and patterns in skip counting to identify multiples, common multiples, and least common multiples between two numbers. This work prepares them for working with larger numbers and fractions.

Lesson No.	Lesson Name	Vocabulary Terms	Learning Objectives
Lesson 3	6-4 Identifying Multiples of Whole Numbers	Multiples-Skip count	<ul style="list-style-type: none">• Students will define multiples of whole numbers.• Students will identify multiples of whole numbers.
	6-5 Common Multiples	Review vocabulary as needed.	<ul style="list-style-type: none">• Students will identify common multiples between two numbers.
Lesson 4	6-6 Relationships between Factors and Multiples	Common multiple-Factor-Multiples-Product.	<ul style="list-style-type: none">• Students will explain the relationship between factors and multiples.• Students will determine if a number is a factor or a multiple of another number.

Lesson 3

6-4 Identifying Multiples of Whole Numbers 6-5 Common Multiples

Learn

Sandy has a piano lesson every seventh day during March. Her first lesson is on March 7. On what other dates in March will she have a piano lesson? The dates of Sandy's lessons are multiples of 7. So, Sandy will have piano lessons on March 14, 21 and 28.

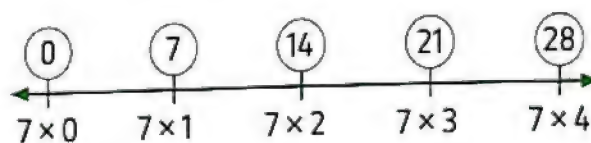
March						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

What is a multiple?

A **multiple** is the product of a given number and another whole number.

To find multiples of any number, multiply by the whole numbers 0, 1, 2, 3, 4, and so on.

The first five multiples of 7 are shown below. A multiple of 7 is any product that has 7 as a factor.

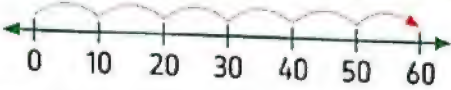



Notes for parents :

- Explain that the number of multiples that a number has is endless.

- You can also make a list or skip-count on a number line to find multiples.

Example 1

Make a list	Use a Number Line
First 7 multiples of 10 : 0, 10, 20, 30, 40, 50, 60	
First 7 multiples of 3 : 0, 3, 6, 9, 12, 15, 18	

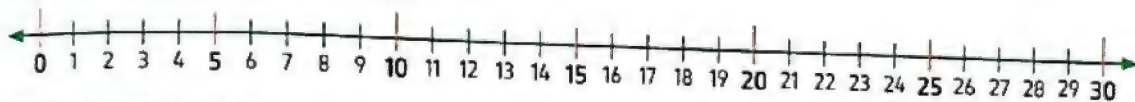
Remark

Zero is
a multiple
for any
number

check your understanding

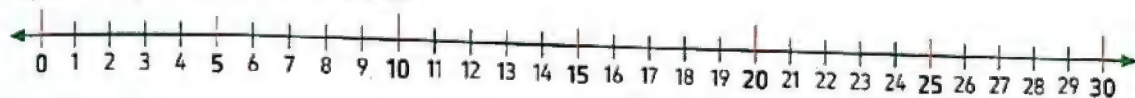
Skip counting on a number line, start at 0 and write the first 5 multiples of each number

1. Skip count by 2s on the number line.



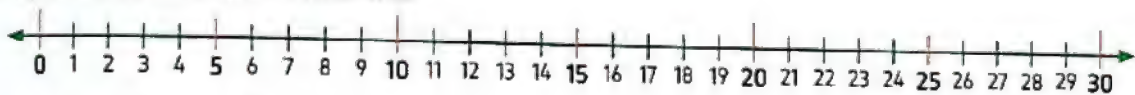
First 5 multiples of 2 : _____, _____, _____, _____, _____

2. Skip count by 4s on the number line.



First 5 multiples of 4 : _____, _____, _____, _____, _____

3. Skip count by 5s on the number line.



First 5 multiples of 5 : _____, _____, _____, _____, _____

- You can use 100 chart to find the multiples (except zero)

For example

To find the multiples of 2 skip count by 2s,
then the multiples of 2 :

2, 4, 6, 8, 10, 12, ...

Start →

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

- Skip counting on the number chart helps your child notice the patterns to help him/her find the multiples more quickly.

Example 2


Find the multiples of 5

Solution 

$5 \times \text{any number} = \text{its multiple}$

Then $5 \times 0 = 0$, $5 \times 1 = 5$, $5 \times 2 = 10$, $5 \times 3 = 15$, ...

So 0 , 5 , 10 , 15 , ... are multiples of 5

 **Check** your understanding

a. List 4 multiples of 8

b. Circle the numbers that are multiples of 3.

12 , 17 , 6 , 22 , 18 , 27

Learn Common Multiples

A **common multiple** is a multiple of two or more numbers.

Finding common multiples using number chart

Look at the column that starts with 2.

All the numbers in this column are multiples of 2.

- List the multiples of 2 on the table.

0 , 2 , 4 , 6 , 8 , 10 , 12 , 14 , 16 , 18 , ...

Look at the column that starts with 3.

All the numbers in this column are multiples of 3.

- List the multiples of 3 on the table.

0 , 3 , 6 , 9 , 12 , 15 , 18 , 21 , 24 , ...

These numbers that are on both lists are common multiples of 2 and 3.

- List the common multiples of 2 and 3.

0 , 6 , 12 , 18 , ...

\times	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

Notes for parents :

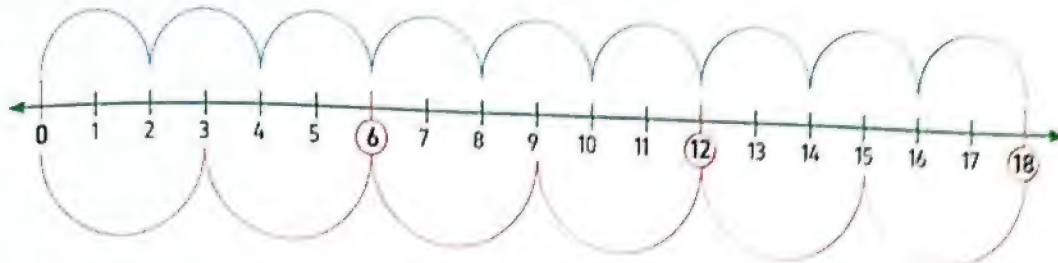
- Ask your child use a number chart to find multiples of a number, ask him/her to use it to find the common multiples of two numbers.

Finding common multiples using number line

- You can use a number line to find common multiples.

Example :

Use a number line to find common multiples of 2 and 3



The common multiples of 2 and 3 are
0, 6, 12, 18, ... and so on.

Remark

Zero is a common multiple
for any numbers.

Example 3

Find the multiples of each of the numbers 4 and 6 up to 50, then find the common multiples between them.

Solution

- The multiples of 4 are: 0, 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48
- The multiples of 6 are: 0, 6, 12, 18, 24, 30, 36, 42, 48
- The common multiples of 4 and 6 are: 0, 12, 24, 36, 48

Check your understanding

Find the multiples of each of 7 and 3 up to 50, then find the common multiples between them.

Solution

The multiples of 7 are _____

The multiples of 3 are _____

The common multiples are _____

- Listing multiples help your child find common multiples.

Exercise 32

6-4 Identifying Multiples of Whole Numbers

6-5 Common Multiples

REMEMBER

UNDERSTAND

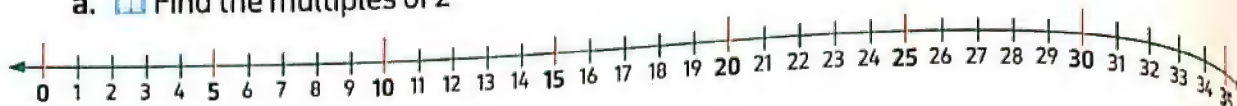
APPLY

PROBLEM SOLVING

From the school book

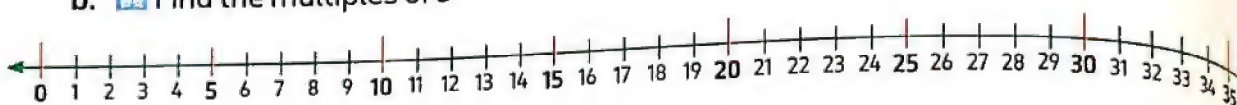
1. Skip counting on a number line. Draw a line connecting each number to show skip counting on the number line. Start at 0 each time.

a. Find the multiples of 2



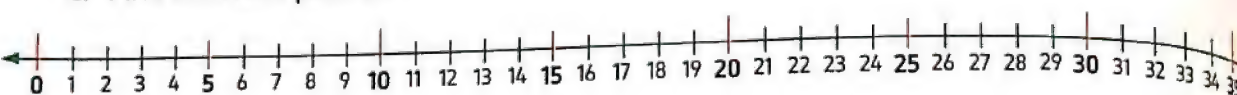
The multiples of 2 are _____

b. Find the multiples of 5



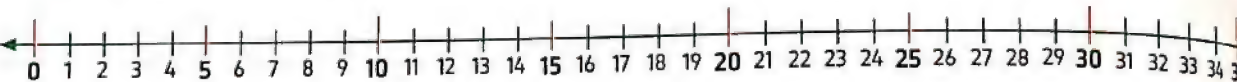
The multiples of 5 are _____

c. Find the multiples of 7



The multiples of 7 are _____

d. Find the multiples of 8



The multiples of 8 are _____

2. Color the multiples. Use the hundreds chart.

a. Color the multiples of 2

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

The multiples of 2 are : _____

b. Color the multiples of 5

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

The multiples of 5 are : _____

c. Color the multiples of 9

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

The multiples of 9 are : _____

d. Color the multiples of 10

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

The multiples of 10 are : _____

3. a. Circle the numbers that are multiples of 6

7 , 16 , 12 , 6 , 21 , 24 , 18

b. Circle the numbers that are multiples of 3

6 , 17 , 21 , 15 , 10 , 36 , 29

c. Circle the numbers that are multiples of 8

6 , 8 , 10 , 16 , 18 , 24 , 30 , 32 , 36

d. Circle the numbers that are multiples of 9

9 , 12 , 18 , 21 , 28 , 27 , 30 , 36 , 40 , 44 , 54

e. Which of the following is NOT a multiple of 4 ?

4 , 30 , 20 , 44 , 36

f. Which of the following is NOT a multiple of 5 ?

5 , 31 , 35 , 40 , 15 , 10 , 16

g. Which of the following is NOT a multiple of 2 ?

6 , 12 , 14 , 7 , 29 , 18 , 17

4. a. List 5 multiples of 7.

b. List 5 multiples of 8.

c. List the multiples of 3 up to 20.

d. List the multiples of 5 up to 30.

e. List the multiples of 9 up to 60.

5. a. Is 34 a multiple of 9? _____

c. Is 35 a multiple of 4? _____

e. Is 7 a multiple of 7? _____

b. Is 40 a multiple of 8? _____

d. Is 30 a multiple of 2? _____

f. Is 81 a multiple of 9? _____

6. Find the missing multiple.

a. 5, 10, 15, _____

d. 70, 80, _____, 100

g. 36, _____, 54, 63

b. 8, 16, 24, _____

e. 12, 15, _____, 21

h. _____, 14, 21, 28

c. 10, 20, _____, 40

f. 22, _____, 44, 55

i. _____, 24, 30, 36

7. a. Find the multiples of each of the numbers 2 and 3 up to 20, then find the common multiples between them.

The multiples of 2 are: _____

The multiples of 3 are: _____

The common multiples are: _____

b. Find the multiples of each of the numbers 5 and 4 up to 30, then find the common multiples between them.

The multiples of 5 are: _____

The multiples of 4 are: _____

The common multiples are: _____

c. Find the multiples of each of the numbers 6 and 8 up to 50, then find the common multiples between them.

The multiples of 6 are: _____


The multiples of 8 are: _____


The common multiples are: _____

8. a.  Find a common multiple of 4 and 8.

b.  Find a common multiple of 7 and 3.

c. Find a common multiple of 5 and 4.


d.  Find two common multiples of 2 and 6.

e.  Find two common multiples of 4 and 6.

f. Find two common multiples of 3 and 9.

9. David has soccer practice every sixth day during June, beginning June 6.
What are the dates of his other practices in June?

10. Nagwa plans to visit her grandparents every fourth day in May. Her first visit will be May 4.
How many times will she visit during May?

11.  **Writing About Math** Tahani takes the bus home from school every day, but it does not take her directly to her house. After the bus drops Tahani off, she must walk the rest of the way home. The bus she takes stops every 4 kilometers as it leaves the school. If Tahani lives 18 km from school, how far does she have to walk home from the bus stop?
Draw a picture to represent your thinking.

Challenge

12. a. Find two common multiples of 2, 3 and 5

b. Find two common multiples of 6, 4 and 10

Multiple Choice Questions

Choose the correct answer.

1. _____ is a multiple of 3.
 A. 4 B. 12
 C. 14 D. 20

2. Which of the following is a multiple of 7?
 A. 3 B. 45
 C. 56 D. 89

3. 20 is a multiple of _____.
 A. 3 B. 6
 C. 8 D. 10

4. Which is a common multiple of 5 and 6?
 A. 20 B. 40
 C. 35 D. 45

5. Which is a common multiple of 10 and 20?
 A. 10 B. 15
 C. 20 D. 25

6. Which is NOT a common multiple of 5 and 6?
 A. 18 B. 27
 C. 36 D. 42

7. Which is NOT a multiple of 6?
 A. 0 B. 30
 C. 20 D. 42

8. The common multiple for all numbers is _____.
 A. 0 B. 1
 C. 2 D. 4

9. The common multiples of 6 and 8 are the same as the multiples of which number?
 A. 8 B. 12
 C. 20 D. 48

10. Which list shows common multiples of 6 and 8?
 A. 6, 8, 24 B. 60, 80, 100
 C. 24, 48, 72 D. 36, 64, 80

11. To identify multiples of 9, Ahmed used the following equations:

Equation 1: $9 \times 2 = 18$

Equation 2: $18 + 9 = 27$

Which statement is true?

- A. Only 18 is a multiple of 9 because it was found by multiplying by 9.
 B. Only 27 is a multiple of 9 because it was found by adding 9.
 C. Both 18 and 27 are multiples of 9 because they were found by multiplying whole numbers by 9.
 D. Both 18 and 27 are multiples of 9 because they were found by multiplying by 9 or adding 9 on to another multiple.

Lesson 4

6-6 Relationships between Factors and Multiples

Learn

You can use a multiplication table to find the relation between factors and multiples.

Step 1

Find 18 on the multiplication table.

- Look at the number at the top of the column. 6 is a factor of 18
- Look at the number at the side of the row. 3 is a factor of 18.

→ row

column
↓

×	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

$$\begin{array}{ccccccc}
 6 & \times & 3 & = & 18 \\
 \uparrow & & \uparrow & & \uparrow \\
 \text{factor} & & \text{factor} & & \text{multiple}
 \end{array}$$

then, 18 is a multiple of each of 6 and 3

Step 2

Find 18 in other places on the table. List other factors of 18.

18 is a multiple of _____, _____

Step 3

Repeat steps 1 and 2 to find factors of 24

- What factors did you find?
- Do you think these are all of the factors of 24? Explain.



Notes for parents :

- Help your child use a multiplication table to recognize the relation between factors and multiples.

Example

Making connection. Think about the relationships between the numbers in each group. Write at least two sentences describing what you notice.

a. 2, 4 and 16

b. 3, 2, 6 and 18

Solution

- a. • $2 \times 2 = 4$, $2 \times 8 = 16$, then all numbers are multiples of 2
 • 2 and 4 are factors of 16
 • 16 is a multiple of 4 [Answers may vary]

- b. • 3 and 2 are factors of 6
 • 18 is a multiple of 6
 • 6 is a multiple of 3 [Answers may vary]

Check your understanding

- a. Write 3 factors of 12. _____, _____, _____
 b. Write 3 multiples of 4. _____, _____, _____
 c. Is 16 a multiple of 8? _____
 d. Is 6 a multiple of 12? _____

Notes for parents :

- Ask your child to explain the difference between a factor and a multiple.

Exercise 33

6-6 Relationships between Factors and Multiples

REMEMBER

UNDERSTAND

APPLY

PROBLEM SOLVING

From the school book

1. Complete the following.

- Write 3 multiples of 5 _____, _____, _____
- Write 3 multiples of 6 _____, _____, _____
- Write 3 factors of 30 _____, _____, _____
- Write 4 factors of 20 _____, _____, _____, _____
- If $4 \times 9 = 36$, then _____ is a multiple of the two numbers _____ and _____
Also, _____ and _____ are factors of the number _____
- If $7 \times 3 =$ _____, then _____ is a multiple of the two numbers _____ and _____

2. Write (✓) to the correct answer and (X) to the incorrect answer.


- 6 is a factor of 2. []
- 8 is a multiple of 4. []
- 12 is a multiple of 3 and 6. []
- 5 is a factor of 30. []
- 45 is an even number that is a multiple of 5 and 9. []
- 27 is an odd number that is a multiple of 3 and 8. []


3. Multiples Riddles. Read each riddle and solve. There may be more than one answer.

- The number is an odd number. It is a multiple of 3 and 5. It is greater than 20.

What number is it?

b. The number is an even number. It is a multiple of 4 and 3 and lies between 20 and 40.
What number is it?


c.  The number is an even number. It is a multiple of 4 and 8. It is between 10 and 20.
What number is it?


d.  The number is an even number. It is a multiple of 3, 4 and 6. What number is it?

e. The number is an even number. It is a multiple of 3, 2 and 7. What number is it?

4. Answer the following questions.

a. Is 2 a factor of 12? _____

c.  Is 14 a multiple of 7? _____

e.  Is 24 a factor of 8? _____


g. Is 0 a multiple of 9? _____

i.  Is 5 a factor of 25 or a multiple of 25? _____

j.  Is 32 a factor of 8 or a multiple of 8? _____


k. Is 1 a factor of 9 or a multiple of 9? _____

l. What multiple of 7 is a factor of 7? _____


b.  Is 6 a factor of 24? _____


d. Is 10 a multiple of 2? _____

f. Is 2 a multiple of 4? _____

h.  Is 16 a multiple of 3? _____


5. Making connections. Think about the relationships between the numbers in each group.
Write at least two sentences describing what you notice.

a.  3, 6 and 12


b.  4, 8, 16 and 24

c. 2, 4, 3, 12

d. 5, 3, 12, 30

6.  How are factors and multiples related?

Challenge

7.  There is a number between 10 and 20 and it is a multiple of the number 4 and a factor of the number 24.

What is this number?

Concept

1

Multiplying by 1-Digit and 2-Digit Factors



Fast Fact

A baby dolphin is called a calf.
A calf eats **4 times** each hour
during the first week of life.

**How many times does it eat
in a day during this time?**

Concept Overview

In concept 1:

Multiplying by One-Digit and Two-Digit Factors, students build on their learning in Primary 3 to deepen and extend their understanding of multiplication and improve their procedural fluency. They explore three different strategies for multiplying - the area model strategy, the partial products algorithm, and the standard algorithm. They apply their knowledge of place value, patterns when multiplying by multiples of 10, and multiplication facts to solve multiplication problems. Good mathematicians make connections between mathematical concepts and use those connections to solve problems. This concept encourages that practice.

Lesson No.	Lesson Name	Vocabulary Terms	Learning Objectives
Lesson 1	7-1 The Area Model Strategy	Area model - Decompose	<ul style="list-style-type: none"> Students will use area models to represent two-digit by one-digit multiplication. Students will explain how they use place value to multiply.
	7-2 The Distributive Property	Area model - Decompose - Distributive property of multiplication	<ul style="list-style-type: none"> Students will use an area model to multiply a one-digit number by a whole number with up to four digits. Students will explain the distributive property of multiplication. Students will apply the distributive property of multiplication to multiply a one-digit number by a whole number with up to four digits.
Lesson 2	7-3 The Partial Products Algorithm	Area model - Distributive property of multiplication - Algorithm - Partial products algorithm	<ul style="list-style-type: none"> Students will use the partial products algorithm to multiply a one-digit number by a whole number with up to four digits.
	7-4 The Standard Multiplication Algorithm	Standard algorithm - Distributive property of multiplication - Area model - Partial products	<ul style="list-style-type: none"> Students will estimate products of multi digit multiplication problems. Students will use the standard algorithm to multiply a one-digit number by a whole number with up to four digits.
	7-5 Review Connecting Strategies	Review vocabulary as needed	<ul style="list-style-type: none"> Students will use the standard algorithm to multiply a one-digit number by a whole number with up to four digits.
Lesson 3	7-6 Two-Digit Multiplication	Distributive property of multiplication	<ul style="list-style-type: none"> Students will identify patterns when multiplying two multiples of 10. Students will multiply a two-digit number by a multiple of 10. Students will assess the reasonableness of an answer using estimation and mental math.
	7-7 Area Models and Two-Digit Multiplication	Review vocabulary as needed	<ul style="list-style-type: none"> Students will be able to use the area model to solve two-digit by two-digit multiplication problems.
Lesson 4	7-8 Algorithms and Two-Digit Multiplication	Review vocabulary as needed.	<ul style="list-style-type: none"> Students will apply a variety of strategies to solve two-digit by two-digit multiplication problems.
	7-9 Putting It All Together	Review vocabulary as needed	<ul style="list-style-type: none"> Students will apply the three reads strategy to analyze and solve story problems. Students will add, subtract, or multiply to solve story problems.



Multiple Choice Questions

Choose the correct answer:

1. _____ is a factor of 6.
A. 2 B. 12
C. 18 D. 24
2. _____ is a multiple of 12.
A. 3 B. 4
C. 6 D. 12
3. _____ is a multiple of 8.
A. 2 B. 4
C. 10 D. 16
4. _____ is an even number that is a multiple of 2, 4, 5.
A. 10 B. 8 C. 15 D. 20
5. _____ is an odd number that is a multiple of 3 and 7.
A. 7 B. 14 C. 21 D. 42
6. Multiples of 2 are _____ numbers.
A. even B. odd C. prime
7. Which of the following is true ?
A. 5 is a multiple of 10 B. 10 is a factor of 5
C. 5 is a factor of 10 D. 6 is a multiple of 4
8. Which of the following is false ?
A. 282 is a multiple of 2 B. 0 is a multiple of 7
C. 3 is a factor of 24 D. 8 is a factor of 14
9. Tell whether the first number is a multiple of the second.
A. 4, 8 B. 2, 20 C. 18, 9 D. 14, 7
10. Which statement is true about multiples of whole numbers ?
A. The number 4 is a multiple of 12 because the numbers 3 and 4 are a factor pair for 12.
B. The number 18 is a multiple of 2 because the numbers 2 and 9 are a factor pair for 18.
C. The number 6 is a multiple of 6 because the numbers 0 and 6 are a factor pair for 6.
D. The number 15 is a multiple of 5 because the numbers 5 and 10 are a factor pair for 15.
11. Which **two** statements explain the relationship between factors and multiples ?
A. Thirty-six is a multiple of 3, 6 and 9, therefore 3, 6 and 9 are factors of 36.
B. Thirty-six is a factor of 3, 6 and 9, therefore 3, 6 and 9 are multiples of 36.
C. 3, 6 and 9 are factors of 36, therefore 3, 6 and 9 are multiples of 36.
D. Twenty-seven is a multiple of 3 and 9, therefore 3 and 9 are factors of 27.
E. Twenty-seven is a factor of 3 and 9, therefore 3 and 9 are multiples of 27.
F. 3 and 9 are factors of 27, therefore 3 and 9 are multiples of 27.

Concept 2 Assessment | Unit 6



1. Write (✓) to the correct answer and (X) to the incorrect answer.

- a. 2 is a factor of 12. ()
- b. 8 is a multiple of 4. ()
- c. 20 is a common multiple of 2 and 5. ()
- d. The common multiple for all numbers is 1. ()
- e. $3 \times 8 = 24$, then 8 is a multiple of 24. ()
- f. 45 is a common multiple for 5 and 3. ()

2. Choose the correct answer.

- a. _____ is a multiple of 6.
A. 1 B. 3 C. 2 D. 6
- b. _____ is a common multiple of 4 and 6.
A. 2 B. 3 C. 8 D. 12
- c. Which is not a common multiple of 2 and 3?
A. 24 B. 20 C. 12 D. 6
- d. _____ is an even number that is a multiple of 2, 3 and 4 and lies between 20 and 30.
A. 12 B. 16 C. 24 D. 28
- e. Which list of numbers are all common multiples of 3 and 7?
A. 1, 3, 7 B. 21, 42, 63 C. 21, 28, 35 D. 15, 21, 27
- f. Is 27 a multiple of 9?
A. yes, because 3 and 9 are factors of 27.
B. no, because 1 and 9 are factors of 9.
C. no, because 9 and 243 are multiples of 27.
D. yes, because 9 and 3 are multiples of 27.

3. Complete.

- a. If $35 = 5 \times 7$, then _____ is a multiple of the two numbers _____ and _____
- b. _____ is a common multiple of 4 and 5 and lies between 10 and 30.
- c. 4 is a multiple of _____
- d. _____ is a multiple of all numbers.

e. Skip count by 8

8 , _____ , 24 , _____ , _____ , 48 , _____

f. 8 is a factor of _____ [Write two numbers].

4. Match.

a.

1.

b.

2.

c.

3.

d.

4.

5. Find the multiples of each of the numbers 6 and 9 up to 60, then find the common multiples between them.

6. Think about the relationships between the numbers 3, 8, 4, and 24. Write at least two sentences describing what you notice.

7. Write 3 factors of 40.

8. Write 3 multiples of 12.

9. **What's the error?** Nermine writes 6, 12, 18, 24, 30 as factors of 6. Describe her error. Write the correct answer.

10. The number is an odd number. It is a multiple of 7 and 3 greater than 20. What numbers is it?

11. The number is an even number. It is a multiple of 3 and 5. It is between 10 and 40. What number is it?

12. • A bus traveling South arrives at a certain bus station every 3 minutes.

• A bus traveling North arrives at the same bus station every 4 minutes.

At 8:10 am., a bus traveling North and a bus traveling South arrive at the station.

This will happen again in _____ minutes, _____ minutes and in _____

minutes because they are all common _____ of 3 and 4. [Complete].

Unit Six Assessment



1. Write (✓) to the correct answer and (X) to the incorrect answer.

- | | |
|--|---|
| a. 4 is a multiple of 12. [] | b. The number 7 has 2 factors. [] |
| c. The GCF of 12 and 18 is 6. [] | d. 13 is a composite number. [] |
| e. 48 is a common multiple for 8 and 7. [] | |
| f. The all factors of 30 are 1, 2, 3, 5, 6, 10. [] | |

2. Choose the correct answer.

- a. Which number is a multiple of 9?
- A. 1 B. 3 C. 27 D. 30
- b. The number _____ has the factors 1, 2, 4, 5, 10, 20.
- A. 10 B. 16 C. 20 D. 30
- c. Which is NOT a common multiple of 3 and 5?
- A. 15 B. 30 C. 40 D. 45
- d. _____ is NOT a prime number.
- A. 1 B. 2 C. 7 D. 11
- e. _____ is a factor for all numbers.
- A. 0 B. 1 C. 2 D. 3
- f. The number 36 has _____ factors.
- A. 3 B. 5 C. 8 D. 9

3. Complete.

- a. The smallest prime number is _____
- b. The composite numbers between 10 and 20 are _____
- c. The GCF of 4 and 8 is _____
- d. The prime number has two different factors are _____ and _____
- e. The factors of 9 are _____
- f. The odd number which is a multiple of 3, 7 and lies between 30 and 50 is _____

4. Match.

a. A factor of 20

b. A GCF for 24 and 30

c. A multiple of 8

d. A prime number

1. 32

2. 10

3. 19

4. 6

5. Find all factors of 30 and create a factor tree, a factor rainbow and T-chart.

6. Find the multiples of each of the numbers 8 and 12 up to 40, then find the common multiples between them.

7. Find the common factors and the greatest common factor (GCF) of 24 and 40.

8. Think about the relationship between the numbers 2, 3, 4, 12
[Write at least two sentences]

9. In each of the following numbers underline the prime numbers and circle the composite numbers.

7 – 8 – 10 – 13 – 21 – 1 – 14

2 – 18 – 15 – 17 – 3 – 4 – 20

10. The number is an even number greater than 20. It has 8 as a factor and is less than 30.
What number is it?

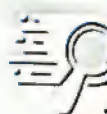
11. List 5 multiples of 6.

12. Is one a prime number? Why?

UNIT
7

Multiplication and Division : Computation and Relationships

- » **Concept 1** : Multiplying by 1-Digit and 2-Digit Factors
- » **Concept 2** : Dividing by 1-Digit Divisors



Fast Fact

The emperor penguin is the world's largest penguin. It can weigh up to 40 kg. In the Antarctic, an adult male emperor penguin will keep a single egg warm for about 63 days until the egg hatches. **About how many weeks will the penguin keep the egg warm ?**



Lesson 1

7-1 The Area Model Strategy 7-2 The Distributive Property

Learn Model 2-digit multiplication

Mazen has 4 boxes of crayons.
Each box holds 12 crayons.
How many crayons does Mazen have in all?



Multiply: 4×12

Step 1

Model the problem using base-ten blocks.



4 tens

$\{4 \times 1 \text{ ten}$
 $= 4 \text{ tens}\}$



8 ones

$\{4 \times 2 \text{ ones}$
 $= 8 \text{ ones}\}$

Step 2

Record your work in a chart like this one.

Tens	Ones
4	8

So, Mazen has 48 crayons in all.

Example 1

Use base-ten blocks to find each product.

a. 22×4

b. 5×13

Solution

a. Model 4 groups of 22.



8 tens



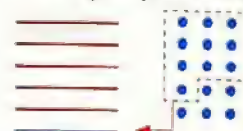
8 ones

Tens	Ones
8	8

So, $22 \times 4 = 88$

b. Model 5 groups of 13.

Regroup 10 ones as 1 ten



Tens	Ones
6	5

So, $5 \times 13 = 65$

Notes for parents :

- Remind your child that when the number of ones blocks is 10 or greater, he/she needs to regroup 10 ones as 1 ten.

Learn**Multiplying with the area model**

The fourth and fifth grades plan to visit the Egyptian Museum.
Each bus has room for 23 passengers.

The teachers have reserved 7 buses.

How many teachers and students can go on the trip?

Multiply: 7×23

Model the problem using the rectangle area model.

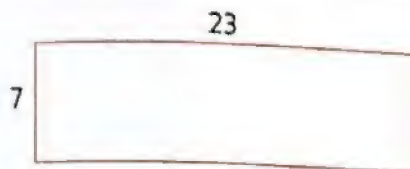


Remember

Area of a rectangle = length \times width

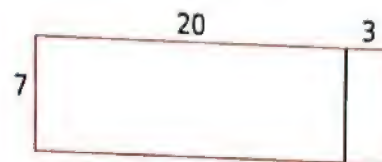
Step 1

Draw a rectangle where the smaller side shows 7 and the longer side shows 23.

**Step 2**

Decompose 23 using place value.

$$23 = 20 + 3$$

**Step 3**

Find the area of each of the new two rectangles, then add them.

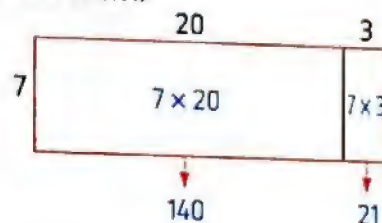
$$7 \times 20 = 140$$

$$7 \times 3 = 21$$

$$140 + 21 = 161$$

$$\text{So, } 7 \times 23 = 161$$

So, 161 passengers can go on the trip

**Example 2**

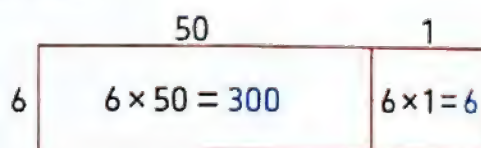
Draw an area model to solve each product.

a. 6×51

b. 39×8

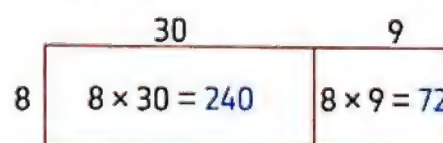
Solution

a. $51 = 50 + 1$



$$\text{So, } 6 \times 51 = 300 + 6 = 306$$

b. $39 = 30 + 9$



$$\text{So, } 39 \times 8 = 240 + 72 = 312$$

• While there are multiple ways to decompose a number, numbers should be decomposed using place value when using an area model for multiplication. For example, it is possible to decompose 23 in many different ways, including 17 and 6, 10 and 13, or 14 and 9. However, 23 should be decomposed into 20 and 3 when using an area model for multiplication.

Learn The distributive property and area models

Youssef is planting a flower garden. He wants to plant 8 rows with 24 sunflowers in each row.

How many sunflowers will he have in this garden?

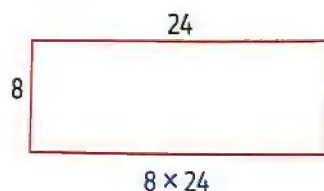
You can use the distributive property to solve this problem.

The **distributive property** states that multiplying a sum by a number is the same as multiplying each addend by the number and then adding the products.



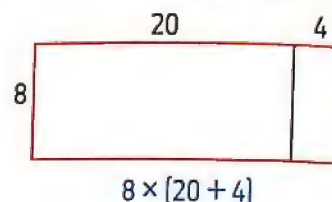
Step 1

Draw a rectangle that is 8 units wide and 24 units long.



Step 2

Break apart the rectangle into two rectangles because 24 has two digits. $24 = 20 + 4$



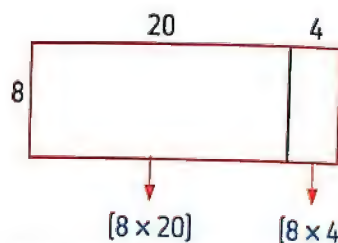
Step 3

Find the area of each of the new two rectangles.

$$8 \times (20 + 4) = [8 \times 20] + [8 \times 4] \text{ "Distributive property"}$$

$$= 160 + 32 = 192$$

So, he will have 192 sunflowers.



Example 3

Use the distributive property to solve each problem.

a. 6×324

b. $7 \times 2,915$

c. 5×407

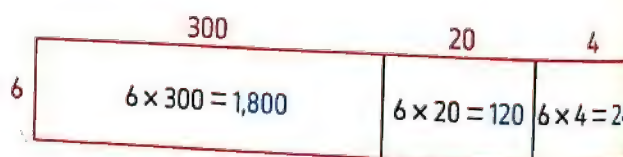
Solution

a. 6×324

$$= 6 \times [300 + 20 + 4]$$

$$= [6 \times 300] + [6 \times 20] + [6 \times 4]$$

$$= 1,800 + 120 + 24 = 1,944$$



Notes for parents :

- Your child may incorrectly decompose the factors according to their digits rather than according to the value of their digits. He/She may decompose 24 as 2 and 4 rather than 20 and 4.

b. $7 \times 2,915$

$$= 7 \times [2,000 + 900 + 10 + 5]$$

$$= [7 \times 2,000] + [7 \times 900] + [7 \times 10] + [7 \times 5]$$

$$= 14,000 + 6,300 + 70 + 35 = 20,405$$

	2,000	900	10	5
7	$7 \times 2,000$ $= 14,000$	7×900 $= 6,300$	7×10 $= 70$	7×5 $= 35$

c. 5×407

$$= 5 \times [400 + 7]$$

$$= [5 \times 400] + [5 \times 7]$$


$$= 2,000 + 35 = 2,035$$

	400	7
5	$5 \times 400 = 2,000$	$5 \times 7 = 35$

Example 4

Laila read 5 books of 224 pages each.

Calculate how many pages she read.

Solution 

What Laila read $= 5 \times 224$

$$= 5 \times [200 + 20 + 4]$$

$$= [5 \times 200] + [5 \times 20] + [5 \times 4]$$

$$= 1,000 + 100 + 20 = 1,120 \text{ pages}$$



	200	20	4
5	$5 \times 200 = 1,000$	$5 \times 20 = 100$	$5 \times 4 = 20$

Check your understanding

Use numbers and symbols to solve each problem.

Draw an area model to help you if necessary.

a. 7×29

b. 4×283

* Your child may get confused with how many zeros to place at the end of a product. For example, your child may write $7 \times 2,000 = 1,400$ instead of $7 \times 2,000 = 14,000$. Your child may also write $5 \times 200 = 100$ instead of $5 \times 200 = 1,000$.

Exercise 34

7-1 The Area Model Strategy

7-2 The Distributive Property

REMEMBER

UNDERSTAND

APPLY

PROBLEM SOLVING

From the school book

1. Use a quick draw to solve each of the problems that follow.

a. 17×4

b. 21×3

c. 14×5

d. Twenty-two passengers can fit on each river bus at a time. What is the maximum number of passengers the river bus can carry if it makes 5 trips?

2. Draw an area model to solve each of the problems that follow.

a. 5×56

b. 8×23

c. 3×66

d. 9×43

e. 91×4

f. 75×2

g. 88×6

h. 67×4

i. 91×6

j. 35×7

k. 78×4

l. 32×7

m. 3×255

n. 7×206

o. 4×594

p. 5×483

q. 7×723

r. 583×6

s. $4 \times 1,237$

t. $8 \times 4,943$

u. $1,193 \times 5$

v. $1,673 \times 8$

3. Use the distributive property to solve each problem as in the example.

► Example: $5 \times 432 = 5 \times (400 + 30 + 2)$
 $= (5 \times 400) + (5 \times 30) + (5 \times 2)$
 $= 2,000 + 150 + 10 = 2,160$

a. 8×35

b. 7×68

c. 2×724

d. 3×684

e. 5×135

f. 8×214

g. 9×463

h. $3 \times 1,476$

i. $9 \times 4,523$

j. $4 \times 9,035$

k. $7 \times 6,003$

l. $8 \times 2,560$

m. 534×6

n. $4,127 \times 3$

4. Find the result of each of the following.

a. 3×29

b. 5×64

c. 7×123

d. 94×6

e. $8 \times 1,374$

f. $2,317 \times 2$

5. Put (✓) for the correct statement and (X) for the incorrect one.

a. $8 \times 245 = 1,960$

()

b. $6 \times 34 = (6 \times 3) + (6 \times 4)$

()

c. $7 \times 100 + 7 \times 50 + 7 \times 3 = 7 \times 153$

()

d. $33 \times 9 = 2,727$

()

e. $5 \times 440 = 5 \times 40 + 5 \times 4$

()

f. $202 \times 7 = 1,414$

()

6. Complete.

a. $5 \times 467 = 5 \times 400 + 5 \times \text{_____} + 5 \times 7$

b. $2 \times 139 = 2 \times \text{_____} + 2 \times \text{_____} + 2 \times 9$

c. $4 \times 7,346 = 4 \times \text{_____} + 4 \times 300 + 4 \times \text{_____} + 4 \times 6$

d. $8 \times \text{_____} = 8 \times 500 + 8 \times 90 + 8 \times 2$

e. $241 \times \text{_____} = 6 \times 200 + 6 \times 40 + 6 \times 1$

f. $3 \times 1,805 = 3 \times \text{_____} + 3 \times \text{_____} + 3 \times \text{_____}$

7. **Error Analysis.** Examine the student work that follows. Identify what the student did correctly and incorrectly, and then try to solve the problem correctly. A student solved the problem 36×8 in the following way:

	3	6	
8	8×3 $= 24$	8×6 $= 48$	
	$36 \times 8 = 72$		$\begin{array}{r} 48 \\ + 24 \\ \hline 72 \end{array}$

Explain your thinking.

8. Answer each of the following problems. Draw an area model to help you if needed.

a. A runner covers 634 meters in a minute.

Calculate the distance he covers in 4 minutes with the same speed.

b. A city bus is 1,280 centimeters long. What is the length of 3 city buses?

c. A trader bought 7 fridges. The price of each fridge is 9,245 pounds. What is the total price of the fridges?

d. A family bought 6 kilograms of meat for 143 pounds a kilogram and 8 liters of juice for 27 pounds a liter. How much money did the family pay?

e. **Animal Company.**

- Multiply. Match each letter to its answer in the blank below to solve the riddle. Some letters are not used.



C	B	Z	A
7×34	4×124	56×8	49×5
O	R	M	N
49×2	$3 \times 2,114$	6×79	9×59

$\frac{\square}{245}$	$\frac{\square}{474}$	$\frac{\square}{98}$	$\frac{\square}{496}$
-----------------------	-----------------------	----------------------	-----------------------

Multiple Choice Questions

Choose the correct answer.

1.  =

- A. 24×2 B. 24×3
C. 14×3 D. 14×2

2. $5 \times \overbrace{\hspace{2cm}}^{34} =$

- A. $[5 \times 3] + [5 \times 4]$
B. $[5 \times 30] + [5 \times 40]$
C. $[5 \times 30] + [5 \times 4]$
D. $[5 \times 3] + [5 \times 40]$

3. $7 \times 509 =$
A. $[7 \times 5] + [7 \times 9]$ B. $[7 \times 50] + [7 \times 9]$
C. $[7 \times 5] + [7 \times 90]$ D. $[7 \times 500] + [7 \times 9]$

4. $[6 \times 40] + [6 \times 8] =$
A. 6×48 B. 6×84
C. 6×480 D. 6×12

5. $4 \times 237 =$
A. 938 B. 944
C. 964 D. 948

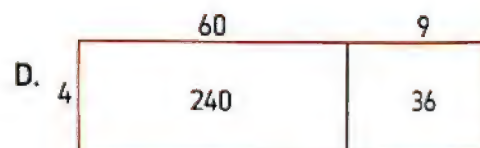
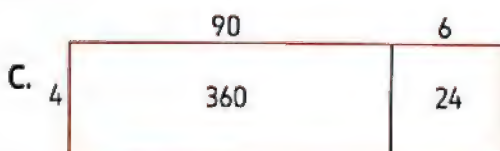
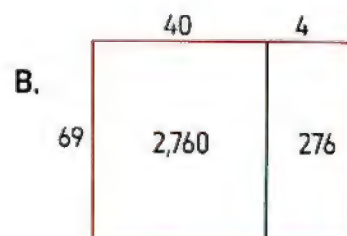
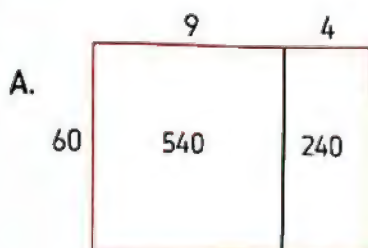
6. $1,663 \times 9 =$
A. 14,937 B. 14,967
C. 14,976 D. 15,967

7. $8 \times 450 =$
A. 36,000 B. 36 tens
C. 36 Hundreds D. 36

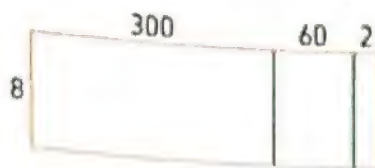
8. $5 \times 30 + 5 =$
A. 5×30 B. 5×31
C. 5×13 D. 5×35

9. Bassem saves 746 pounds monthly, then how much money does he save in 9 months?
A. 6,514 B. 6,714 C. 6,914 D. 6,974

10. Which area model best represents 69×4 ?



11. What is the correct way to use the area model to multiply 362×8 ?

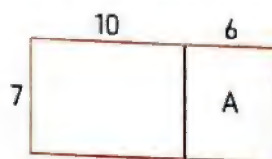


- A. $(300 \times 8) + (60 \times 8) + (2 \times 8)$
 B. $(360 \times 2) + (62 \times 8)$
 C. $(300 \times 8) \times (60 \times 8) \times (2 \times 8)$
 D. $(360 \times 8) \times (2 \times 8)$

12. Which choice correctly uses the Distributive Property of Multiplication to find the product of 429×7 ?

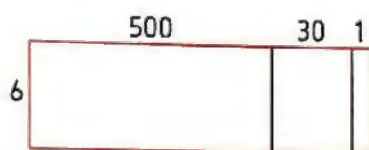
- A. $(4 \times 7) + (2 \times 7) + (9 \times 7)$
 B. $(400 \times 7) + (20 \times 7) + (9 \times 7)$
 C. $(4 + 7) \times (2 + 7) \times (9 + 7)$
 D. $(400 + 7) \times (20 + 7) \times (9 + 7)$

13. The area model represents 16×7 . What number representing the area of rectangle A?



- A. 7
 B. 70
 C. 42
 D. 420

14. Based on the area model, what is 531×6 ?



- A. 54
 B. 486
 C. 3,186
 D. 30,186

15. Which statements correctly represent the product $1,385 \times 4$? Choose *two* correct answers.

- A. $1,385 \times 4 = (4 \times 1,000) + (4 \times 300) + (4 \times 80) + (4 \times 5)$
 B. $1,385 \times 4 = (13 \times 4) + (85 \times 4)$
 C. $1,385 \times 4 = 1,000 + 300 + 80 + 20$
 D. $1,385 \times 4 = 4,000 + 1,200 + 320 + 20$
 E. $1,385 \times 4 = 1,000 + 300 + 80 + (5 \times 4)$

Lesson 2

- 7-3 The Partial Products Algorithm
- 7-4 The Standard Multiplication Algorithm
- 7-5 Review Connecting Strategies

Learn

The partial products algorithm

At the Zoo, you can take a ride around the pond on a boat.
If it takes 16 minutes to go around the pond in the boat, how many minutes does it take to go around the pond twice?



Multiply : 16×2

Use the partial products algorithm as follows.

Step 1

Multiply the tens.

$$\begin{array}{r} 16 \\ \times 2 \\ \hline 20 \end{array} \rightarrow (10 \times 2)$$

Step 2

Multiply the ones.

$$\begin{array}{r} 16 \\ \times 2 \\ \hline 20 \\ 12 \end{array} \rightarrow (6 \times 2)$$

Step 3

Add the products.

$$\begin{array}{r} 16 \\ \times 2 \\ \hline 20 \\ + 12 \\ \hline 32 \end{array}$$

So, it takes 32 minutes.

Hint

You can multiply the ones first, then multiply the tens as follows.

Step 1

Multiply the ones.

$$\begin{array}{r} 16 \\ \times 2 \\ \hline 12 \end{array} \rightarrow (6 \times 2)$$

Step 2

Multiply the tens.

$$\begin{array}{r} 16 \\ \times 2 \\ \hline 12 \\ 20 \end{array} \rightarrow (10 \times 2)$$

Step 3

Add the products.

$$\begin{array}{r} 16 \\ \times 2 \\ \hline 12 \\ + 20 \\ \hline 32 \end{array}$$

Notes for parents :

- Your child should recognize that the commutative property of multiplication allows us to write the factors in any order.

Example 1

Use the partial products algorithm to solve the following.

a. 76×3

b. 8×214

c. $6 \times 1,352$

Solution 

a.

$$\begin{array}{r} 76 \\ \times 3 \\ \hline 210 \\ + 18 \\ \hline 228 \end{array}$$

$\rightarrow [70 \times 3]$ "Multiplying the tens"

$\rightarrow [6 \times 3]$ "Multiplying the ones"

b.

$$\begin{array}{r} 214 \\ \times 8 \\ \hline 1,600 \\ + 80 \\ + 32 \\ \hline 1,712 \end{array}$$

$\rightarrow [200 \times 8]$ "Multiplying the hundreds"

$\rightarrow [10 \times 8]$ "Multiplying the tens"

$\rightarrow [4 \times 8]$ "Multiplying the ones"

c.

$$\begin{array}{r} 1,352 \\ \times 6 \\ \hline 6,000 \\ + 1,800 \\ + 300 \\ + 12 \\ \hline 8,112 \end{array}$$

$\rightarrow [1,000 \times 6]$ "Multiplying the thousands"

$\rightarrow [300 \times 6]$ "Multiplying the hundreds"

$\rightarrow [50 \times 6]$ "Multiplying the tens"

$\rightarrow [2 \times 6]$ "Multiplying the ones"

**Check** your understanding

Fill in the blanks with the missing numbers to multiply.

a.

$$\begin{array}{r} 35 \\ \times 5 \\ \hline 150 \text{ [} ____ \times ____ \text{]} \\ + 25 \text{ [} ____ \times ____ \text{]} \\ \hline 175 \end{array}$$

b.

$$\begin{array}{r} 254 \\ \times 6 \\ \hline ____ \text{ [} 6 \times 200 \text{]} \\ + 300 \text{ [} 6 \times ____ \text{]} \\ + ____ \text{ [} 6 \times 4 \text{]} \\ \hline \end{array}$$

• Remind your child to line up the products carefully according to the place value.

Learn

The standard multiplication algorithm

Maha has a book case with 3 shelves.
There are 24 books on each shelf.
How many books are there in all?

Find : 24×3

You can use the standard multiplication algorithm.



Step 1

Multiply the ones.

3×4 ones = 12 ones

Regroup the ones.

$$\begin{array}{r} 1 \\ 24 \\ \times 3 \\ \hline 2 \end{array}$$

Regroup
12 ones as
1 ten and
2 ones

Step 2

Multiply the tens.

3×2 tens = 6 tens

, then add the
regrouped ten

6 tens + 1 ten = 7 tens

$$\begin{array}{r} 1 \\ 24 \\ \times 3 \\ \hline 2 \\ + 70 \\ \hline 72 \end{array}$$

So, there are 72 books in all.

Example 2

Use the standard multiplication algorithm to solve the following.

a. 6×512

b. $2,194 \times 7$

Solution

a.

$$\begin{array}{r} 1 \\ 512 \\ \times 6 \\ \hline \end{array}$$

$$\times 6$$

2 \rightarrow [6×2 ones = 12 ones = 1 ten + 2 ones]

+ 70 \rightarrow [6×1 ten = 6 tens, 6 tens + 1 ten = 7 tens]

+ 3,000 \rightarrow [6×5 hundreds = 30 hundreds = 3 thousands]

$$\hline 3,072$$



Notes for parents :

- Your child sometimes has difficulty demonstrating proper regrouping when using the standard algorithm for multiplication. He/She may omit writing the digit above the correct place or he/she may attempt to place two digits at a time in the product.

$$\begin{array}{r} 1\ 6\ 2 \\ 2,194 \\ \times \quad 7 \\ \hline \end{array}$$

8 \rightarrow $[7 \times 4 \text{ ones} = 28 \text{ ones} = 2 \text{ tens} + 8 \text{ ones}]$

+ 50 \rightarrow $[7 \times 9 \text{ tens} = 63 \text{ tens}, 63 \text{ tens} + 2 \text{ tens} = 65 \text{ tens} = 6 \text{ hundreds} + 5 \text{ tens}]$

+ 300 \rightarrow $[7 \times 1 \text{ hundred} = 7 \text{ hundreds}, 7 \text{ hundreds} + 6 \text{ hundreds} = 13 \text{ hundreds} = 1 \text{ thousand} + 3 \text{ hundreds}]$

+ 15,000 \rightarrow $[7 \times 2 \text{ thousands} = 14 \text{ thousands}, 14 \text{ thousands} + 1 \text{ thousand} = 15 \text{ thousands}]$

15,358

Hint

You can write the products in a short way as the following examples.

Example 3

Find $3 \times 1,276$

Solution 

Step 1

Multiply the ones.

$$\begin{array}{r} 1 \\ 1,276 \\ \times \quad 3 \\ \hline 8 \end{array}$$

Step 2

Multiply the tens.

$$\begin{array}{r} 21 \\ 1,276 \\ \times \quad 3 \\ \hline 28 \end{array}$$

Step 3

Multiply the hundred.

$$\begin{array}{r} 21 \\ 1,276 \\ \times \quad 3 \\ \hline 828 \end{array}$$

Step 4

Multiply the thousands.

$$\begin{array}{r} 21 \\ 1,276 \\ \times \quad 3 \\ \hline 3,828 \end{array}$$


More Examples :

a.
$$\begin{array}{r} 11 \\ 234 \\ \times \quad 3 \\ \hline 702 \end{array}$$

b.
$$\begin{array}{r} 31 \\ 852 \\ \times \quad 6 \\ \hline 5,112 \end{array}$$

c.
$$\begin{array}{r} 21 \\ 2,814 \\ \times \quad 3 \\ \hline 8,442 \end{array}$$

d.
$$\begin{array}{r} 642 \\ 3,964 \\ \times \quad 7 \\ \hline 27,748 \end{array}$$

 **Check** your understanding

Find the products.

a. 56×4

b. 3×174

c.
$$\begin{array}{r} 4,015 \\ \times \quad 2 \\ \hline \end{array}$$

• Train your child to use the short way to find the products.

Learn Estimate products. Choose a strategy**Example 4**

Estimate the product. Multiply to check.

a. 3×62

b. 284×7

Solution 

- a. Round 62 to the greatest place value.

$$\begin{array}{r} 3 \times 62 \\ \downarrow \\ 3 \times 60 = 180 \end{array}$$

You can use any multiplication strategy to find the actual product.



The actual product : (Using Area Model Strategy)

	60	2
3	$3 \times 60 = 180$	$3 \times 2 = 6$

$3 \times 62 = 180 + 6 = 186$

b.

Round to the nearest ten

$$\begin{array}{r} 284 \longrightarrow 280 \\ \times \quad 7 \\ \hline 1,960 \end{array}$$

Or

Round to the nearest hundred

$$\begin{array}{r} 284 \longrightarrow 300 \\ \times \quad 7 \\ \hline 2,100 \end{array}$$

The actual product : (Using the Standard Multiplication Strategy)

$$\begin{array}{r} 52 \\ 284 \\ \times 7 \\ \hline 8 \\ + 80 \\ + 1,900 \\ \hline 1,988 \end{array}$$

**Notes for parents :**

- Let your child use rounding to check the reasonableness of the answer.

Example 5

Samy says that $7 \times 58 = 91$
Describe Samy's error and find
the correct product.

0	0	0	0	0	0	0	0
						5	8
						\times	7
						<hr/>	
						3	5
						$+$	5
						5	6
						<hr/>	
						9	1

Solution 

The error is multiplying the tens $7 \times 50 = 35$ instead
of $7 \times 50 = 350$

The correct product is **406**

						5	8
						\times	7
						<hr/>	
						3	5
						0	
						$+$	5
						6	
						<hr/>	
						4	0
						6	

$\rightarrow [7 \times 50]$
 $\rightarrow [7 \times 8]$

check your understanding

Estimate the product. Choose a strategy to find the actual product.

a. 87
 $\times 6$

b. 764
 $\times 5$

c. 4×341



• Your child may have difficulty determining the number of zeros in a product when multiplying by multiples of 10, especially when the product of the basic fact ends in zero. For example, your child may think that $80 \times 5 = 40$ rather than 4,00.

Exercise 35

7-3 The Partial Products Algorithm 7-4 The Standard Multiplication Algorithm 7-5 Review Connecting Strategies

REMEMBER

UNDERSTAND

APPLY

PROBLEM SOLVING

From the school book

1. Fill in the blanks with the missing numbers.

a.

$$\begin{array}{r} 28 \\ \times 6 \\ \hline 120 \\ + 48 \\ \hline 168 \end{array} \quad \begin{array}{l} [\quad \times \quad] \\ [\quad \times \quad] \end{array}$$

b.

$$\begin{array}{r} 239 \\ \times 7 \\ \hline 1,400 \\ + 210 \\ + 63 \\ \hline 1,673 \end{array} \quad \begin{array}{l} [\quad \times \quad] \\ [\quad \times \quad] \\ [\quad \times \quad] \end{array}$$

c.

$$\begin{array}{r} 1,485 \\ \times 2 \\ \hline 2,000 \\ + 800 \\ + 160 \\ + 10 \\ \hline 2,970 \end{array} \quad \begin{array}{l} [\quad \times \quad] \\ [\quad \times \quad] \\ [\quad \times \quad] \\ [\quad \times \quad] \end{array}$$

d.

$$\begin{array}{r} 634 \\ \times 5 \\ \hline \quad \quad \quad [5 \times 600] \\ + 150 [\quad \times \quad] \\ + \quad \quad [5 \times 4] \\ \hline \end{array}$$

e.

$$\begin{array}{r} 2,523 \\ \times 5 \\ \hline 10,000 [\quad \times 2,000] \\ + \quad \quad [5 \times 500] \\ + 100 [5 \times \quad] \\ + \quad \quad [5 \times 3] \\ \hline \end{array}$$

f.

$$\begin{array}{r} 6,421 \\ \times 6 \\ \hline 36,000 [\quad \times \quad] \\ + \quad \quad [6 \times 400] \\ + 120 [6 \times \quad] \\ + \quad \quad [6 \times 1] \\ \hline \end{array}$$

2. Solve using the partial products algorithm.

a. 8×67

b. 29×4

c. 5×343

d. 6×678

e. 284×4

f. 305×7

g. $3 \times 2,539$

h. $4,731 \times 4$

3. Estimate the product, then solve using the standard algorithm as in the example.

Example

$$\begin{array}{r} 38 \\ \times 7 \\ \hline \end{array}$$

Estimate

$$\begin{array}{r} 40 \\ \times 7 \\ \hline 280 \end{array}$$

Answer

$$\begin{array}{r} 5 \\ 38 \\ \times 7 \\ \hline 6 \\ + 260 \\ \hline 266 \end{array}$$

a. 

$$\begin{array}{r} 17 \\ \times 6 \\ \hline \end{array}$$

Estimate

Answer

b. 

$$\begin{array}{r} 32 \\ \times 3 \\ \hline \end{array}$$

Estimate

Answer

c.

$$\begin{array}{r} 289 \\ \times 4 \\ \hline \end{array}$$

Estimate

Answer

d. 

$$\begin{array}{r} 134 \\ \times 2 \\ \hline \end{array}$$

Estimate

Answer

e. 

$$\begin{array}{r} 758 \\ \times 3 \\ \hline \end{array}$$

Estimate

Answer

f. 

$$\begin{array}{r} 1,349 \\ \times 2 \\ \hline \end{array}$$

Estimate

Answer

g.

$$\begin{array}{r} 4,917 \\ \times 5 \\ \hline \end{array}$$

Estimate


Answer

h. 

$$\begin{array}{r} 2,327 \\ \times 4 \\ \hline \end{array}$$

Estimate

Answer

4.  Solve using the standard algorithm.

a. 7×30

b. 27×3

c. 4×800

d. 284×4


e. 630×5


f. 204×2

g. 735×5


h. $1,390 \times 2$


i. $2,213 \times 4$


5. Compare. Write "< , > or =" for each .


a. 4×326  3×467

b. 8×199  5×321

c. $2 \times 3,750$  $3 \times 2,500$

d. 5×272  6×231

e. 7×408  6×476

f. $4 \times 7,424$  $8 \times 3,695$

6. **What's the Error?** Hany made an error in his multiplication. Describe his error, and explain how to find the correct answer.

Hany

$$\begin{array}{r} 2,206 \\ \times 4 \\ \hline 8,884 \end{array}$$

7. Three students tried solving 328×2 using the standard algorithm. Explain who you think solved the problem correctly and identify at least one error in another student's solution.

Student 1

$$\begin{array}{r} 328 \\ \times 2 \\ \hline 646 \end{array}$$

Student 2

$$\begin{array}{r} 1 \\ 328 \\ \times 2 \\ \hline 656 \end{array}$$

Student 3

$$\begin{array}{r} 1 \\ 328 \\ \times 2 \\ \hline 746 \end{array}$$

8. How can you tell without solving the whole problem whether 53×7 is less than or greater than 350?

9. **Fix the Error.**

Look at the standard algorithm solution for each multiplication problem.

Circle the problem if the solution is correct. If the solution is incorrect, fix the error.

$$\begin{array}{r} 2 \\ 158 \\ \times 3 \\ \hline 374 \end{array}$$

$$\begin{array}{r} 21 \\ 3,142 \\ \times 5 \\ \hline 15,710 \end{array}$$

$$\begin{array}{r} 98 \\ \times 2 \\ \hline 86 \end{array}$$

$$\begin{array}{r} 1 \\ 470 \\ \times 4 \\ \hline 1,880 \end{array}$$

$$\begin{array}{r} 143 \\ 1,286 \\ \times 6 \\ \hline 6,286 \end{array}$$

 **Challenge**

10. Find the missing numbers on Manal paper. Explain your thinking.

Manal

$$\begin{array}{r} 4,623 \\ \times \quad \quad \\ \hline 36,94 \end{array}$$

Multiple Choice Questions

Choose the correct answer:

1.
$$\begin{array}{r} 54 \\ \times 7 \\ \hline \end{array}$$

- A. 63 B. 378
C. 278 D. 368

2.
$$\begin{array}{r} 235 \\ \times 6 \\ \hline \end{array}$$

- A. 60 B. 1,200
C. 1,410 D. 3,192

3. $2 \times 1,324 =$ _____

- A. 2,648 B. 8,462
C. 26,480 D. 2,688

4. $504 \times 6 =$ _____

- A. 324 B. 30,240
C. 3,240 D. 3,024

5. The product of 192×3 is near close to _____

- A. 400 B. 500
C. 600 D. 700

6. Which product is NOT correct ?

- A. $63 \times 4 = 252$
B. $3 \times 48 = 144$
C. $7 \times 27 = 149$
D. $6 \times 153 = 918$

7. Which statement is true ? "Estimate"

- A. The product of 3 and 27 is less than 60.
B. The product of 5 and 41 is less than 200.
C. The product of 4 and 113 is greater than 400.
D. The product of 7 and 98 is greater than 700.

8. What is the ones digit of the product of 53×6 will be without solving the whole problem ?

- A. 3 B. 6 C. 8 D. 9

Lesson 3

7-6 Two-Digit Multiplication

7-7 Area Models and Two-Digit Multiplication

Learn Multiplying two multiples of 10

Essam bought 20 statues for 30 pounds each as souvenirs, how much money did he pay?

Remember

The numbers 10, 20, 30, 40, ... are multiples of 10.

Multiply: 20×30

How to find the product of 20×30 .

$$\begin{array}{r} \times \\ 20 \times 30 = 600 \end{array}$$

- Multiply $2 \times 3 = 6$ (Basic Fact)
- Put 00 on the right to get the number 600.

So, he paid 600 pounds.

$$20 \times 30 = 600$$




Notes for parents :

- Let your child notice that the product has as many zeroes as the total number of zeroes in the factors plus any additional zeroes in the basic fact product.

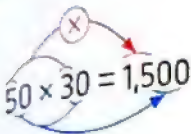
Example 1

Find the product.

a. 50×30

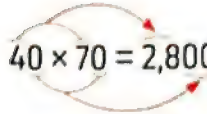
Solution 

a. $50 \times 30 = 1,500$



b. 40×70

b. $40 \times 70 = 2,800$




Another Solution

a. $50 \times 30 = [5 \times 10] \times [3 \times 10]$
 $= 5 \times 3 \times 10 \times 10$ "Commutative property"
 $= [5 \times 3] \times [10 \times 10]$ "Associative property"
 $= 15 \times 100 = 1,500$

b. $40 \times 70 = [4 \times 10] \times [7 \times 10]$
 $= [4 \times 7] \times [10 \times 10]$
 $= 28 \times 100$
 $= 2,800$

You can use
the properties of
multiplication



 **Check** your understanding

1. Multiply : 70×40

- Find the product of 7 and 4 _____
- How many zeroes are in the two factors ? _____
- Write the product of 70 and 40 _____

2. Multiply : 80×90

- Find the product of 8 and 9. _____
- How many zeroes are in the two factors ? _____
- Write the product of 80 and 90 _____

* Let your child notice the number of zeroes in each product.

Learn**Multiplying a 2-digit number by a multiple of 10**

A primary school is formed of 30 classes of 25 pupils each.

Calculate the total number of pupils.

Multiply: 30×25

You can use the area model.

	20	5
30	$30 \times 20 = 600$	$30 \times 5 = 150$



$$30 \times 25 = 600 + 150 = 750$$

So, the total number of pupils is 750.

Example 2

Multiply.

a. 60×17

b. 48×90

Solution 💡

$$\begin{aligned} \text{a. } 60 \times 17 &= 600 + 420 \\ &= 1,020 \end{aligned}$$

	10	7
60	$60 \times 10 = 600$	$60 \times 7 = 420$

$$\begin{aligned} \text{b. } 48 \times 90 &= 3,600 + 720 \\ &= 4,320 \end{aligned}$$

	40	8
90	$90 \times 40 = 3,600$	$90 \times 8 = 720$

Check your understanding

► Multiply: 28×70

Work area

Notes for parents :

- Let your child notice that the product of any number and a multiple of 10 has a zero in the ones place.

Learn**Area models and two-digit multiplication.**

Bassem bought 12 books to read. Each book costs 47 pounds.
How much money did Bassem pay?

Multiply: 12×47

You can use the area model as follows.

$$\bullet 12 = 10 + 2$$

$$\bullet 47 = 40 + 7$$

	\times	40	7
12	10	$10 \times 40 = 400$	$10 \times 7 = 70$
	2	$2 \times 40 = 80$	$2 \times 7 = 14$

$$12 \times 47 = 400 + 70 + 80 + 14 = 564$$

So, Bassem paid 564 pounds.

**Example 3**

Use the area model to solve the following.

a. 74×33

b. 49×56

Solution

a. $\bullet 74 = 70 + 4$

$\bullet 33 = 30 + 3$

\times	30	3
70	$70 \times 30 = 2,100$	$70 \times 3 = 210$
4	$4 \times 30 = 120$	$4 \times 3 = 12$

$$74 \times 33 = 2,100 + 210 + 120 + 12 = 2,442$$

b. $\bullet 49 = 40 + 9$ $\bullet 56 = 50 + 6$

\times	40	9
50	$50 \times 40 = 2,000$	$50 \times 9 = 450$
6	$6 \times 40 = 240$	$6 \times 9 = 54$

$$49 \times 56 = 2,000 + 450 + 240 + 54 = 2,744$$

Check your understanding

► Multiply: 41×36

- Let your child write the factors in expanded form before finding product.
- Make sure that your child multiplies the correct numbers together.

Exercise 36

7-6 Two-Digit Multiplication

7-7 Area Models and Two-Digit Multiplication

REMEMBER

UNDERSTAND

APPLY

PROBLEM SOLVING

From the school book

1. Find the following products.

a. $20 \times 40 =$ _____

d. $40 \times 70 =$ _____

g. $40 \times 40 =$ _____

j. $50 \times 80 =$ _____

m. $70 \times 70 =$ _____

p. $80 \times 80 =$ _____

b. $30 \times 50 =$ _____

e. $50 \times 60 =$ _____

h. $50 \times 90 =$ _____

k. $60 \times 30 =$ _____

n. $80 \times 70 =$ _____

q. $80 \times 90 =$ _____

c. $20 \times 80 =$ _____

f. $30 \times 90 =$ _____

i. $60 \times 20 =$ _____

l. $60 \times 80 =$ _____

o. $90 \times 70 =$ _____

r. $90 \times 90 =$ _____

2. Complete the table.

	Problem	Area Model	Numbers and symbols
a.	40×62	_____	2,480
b.	70×55	_____	_____
c.	54×30	_____	_____
d.	40×78	_____	_____
e.	44×20	_____	_____
f.	15×30	_____	_____
g.	10×40	_____	_____
h.	72×40	_____	_____

3. Solve.

a. $10 \times 56 =$

c. $20 \times 66 =$

e. $30 \times 78 =$

g. $70 \times 87 =$

b. $20 \times 54 =$

d. $30 \times 18 =$

f. $23 \times 40 =$

h. $90 \times 32 =$

4. Create area models to solve the problems.

a. 81×23

x		

b. 45×28

x		

c. 60×12

x		

d. 22×17

x		

e. 34×19

x		

f. 72×15

x		

g. 24×37

x		

h. 45×29

x		

i. 61×26

x		

j. 58×44

x		

5. **Error Analysis.**

- ★ Examine the student's work. Is his answer reasonable? How do you know? Explain your thinking.

$$22 \times 50 = (20 + 2) \times 50 = (20 \times 50) + (2 \times 50) = 100 + 100 = 200$$

6. Answer the following.

- a. A merchant bought 20 boxes of soft drinks for 40 pounds each. How much money did he pay?



- b. ☐ A group of 38 people want to travel by bus. Each bus ticket costs 30 L.E. How much do they need to pay in all?



- c. The book store ordered 34 boxes of a new book. There were 24 books in each box. How many copies of the book did they receive?



- d. Mina runs 14 hours every week. What is the number of running hours in 29 weeks?



- e. A jar of sweets holds 84 sweets. How many sweets are there in 16 jars?





Multiple Choice Questions

Choose the correct answer.

1. $40 \times 90 =$ _____

- ☐ A. 36 B. 360
☐ C. 3,600 D. 36,000

2. _____ $\times 70 = 3,500$

- ☐ A. 30 B. 35
☐ C. 50 D. 53

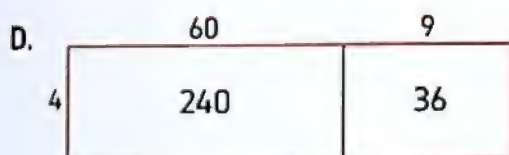
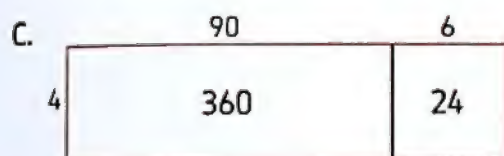
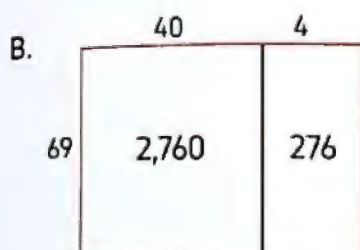
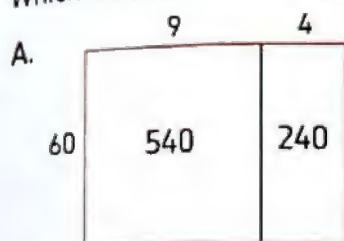
3. $53 \times 8 =$ _____

- ☐ A. 280 B. 424
☐ C. 64 D. 640

4. $19 \times 30 =$ _____

- ☐ A. 57 B. 1,930
☐ C. 273 D. 570

5. Which area model best represents 69×4 ?



6. John's study group is coming to his house.

There are 11 people in the group, including John. He would like that each person in the group to have 12 crackers as snacks. Which area model represents this problem?

A.

\times	11	1
12	132	12
2	22	2

B.

\times	1	11
12	12	12
11	11	11

C.

\times	10	1
10	100	10
2	20	2

D.

\times	10	1
1	10	1
2	20	2

7. What is the unknown value in the area model representing 28×53 ?

\times	50	3
20	1,000	60
8	?	24

- A. 40
B. 400
C. 4,000
D. 850

8. What is the correct way to use the area model to multiply 54×27 ?

\times	50	4
20		
7		

- A. $7 + 20 + 50 + 4 = 81$
B. $1,000 + 350 + 80 = 1,430$
C. $1,000 + 350 + 80 + 28 = 1,458$
D. $10,000 + 350 + 80 + 28 = 10,458$

9. Mona made 11 bracelets. There are 13 beads on each bracelet. How many beads are there on all 8 bracelets?

- A. 130
B. 132
C. 143
D. 156



Lesson 4

7-8 Algorithms and Two-Digit Multiplication 7-9 Putting It All Together

Learn Multiplying 2-digit numbers by partial products

A group of 25 students each jumped rope for 13 minutes.

How many minutes in all did they jump rope?

Multiply: 25×13

You can use algorithm of partial products as follows.



Step 1

Multiply the ones
by the ones

$$\begin{array}{r} 25 \\ \times 13 \\ \hline 15 \end{array} \leftarrow 3 \times 5 = 15$$

Line up partial
products in
the correct place
value.

Step 2

Multiply the ones
by the tens

$$\begin{array}{r} 25 \\ \times 13 \\ \hline 15 \\ 60 \end{array} \leftarrow 3 \times 20 = 60$$



Step 3

Multiply the tens by the ones

$$\begin{array}{r} 25 \\ \times 13 \\ \hline 15 \\ 60 \\ 50 \end{array} \leftarrow 10 \times 5 = 50$$

Step 4

Multiply the tens by the tens.
Then add the partial products.

$$\begin{array}{r} 25 \\ \times 13 \\ \hline + 15 \\ + 60 \\ + 50 \\ \hline 200 \\ 325 \end{array} \leftarrow 10 \times 20 = 200$$

So, the number of minutes in all is **325**

Notes for parents :

- In this lesson, your child will apply a variety of strategies to solve two-digit by two-digit multiplication problems.

Example 1

Estimate. Then find the product by the algorithm of partial products.

a. 19×42

b. 81×37

Solution

a.	Estimation	Multiplication
	$19 \times 42 = \underline{\hspace{2cm}}$ $\downarrow \quad \downarrow$ $20 \times 40 = 800$	$\begin{array}{r} 19 \\ \times 42 \\ \hline 18 \quad \leftarrow [2 \times 9] \\ + 20 \quad \leftarrow [2 \times 10] \\ + 360 \quad \leftarrow [40 \times 9] \\ + 400 \quad \leftarrow [40 \times 10] \\ \hline 798 \end{array}$

Since, the estimation 800 is close to 798, then it is reasonable.

b.	Estimation	Multiplication
	$81 \times 37 = \underline{\hspace{2cm}}$ $\downarrow \quad \downarrow$ $80 \times 40 = 3,200$	$\begin{array}{r} 81 \\ \times 37 \\ \hline 7 \quad \leftarrow [7 \times 1] \\ + 560 \quad \leftarrow [7 \times 80] \\ + 30 \quad \leftarrow [30 \times 1] \\ + 2,400 \quad \leftarrow [30 \times 80] \\ \hline 2,997 \end{array}$

Since, the estimation 3,200 is close to 2,997, then it is reasonable.

✓ Check your understanding

Copy and complete.

a.

$$\begin{array}{r} 45 \\ \times 72 \\ \hline 10 \quad \leftarrow [\square \times \square] \\ + 80 \quad \leftarrow [\square \times \square] \\ + 350 \quad \leftarrow [\square \times \square] \\ + 2,800 \quad \leftarrow [\square \times \square] \\ \hline 3,240 \end{array}$$

b.

$$\begin{array}{r} 23 \\ \times 98 \\ \hline 24 \quad \leftarrow [\square \times \square] \\ + 160 \quad \leftarrow [\square \times \square] \\ + 270 \quad \leftarrow [\square \times \square] \\ + 1,800 \quad \leftarrow [\square \times \square] \\ \hline 2,254 \end{array}$$

Notes for parents :

• Your child may have difficulty decomposing numbers when a problem is written vertically.

Learn**Multiplying 2-digit numbers by standard algorithm**

An animator creates 24 pictures for each second of an animated cartoon.

How many pictures are drawn to make a cartoon that is 45 seconds long?

Multiply: 24×45

**Step 1**

Multiply by ones.

$$\begin{array}{r} 24 \\ \times 45 \\ \hline 120 \end{array} \leftarrow 5 \times 24$$

Step 2

Multiply by tens.

$$\begin{array}{r} 24 \\ \times 45 \\ \hline 120 \\ 960 \end{array} \leftarrow 40 \times 24$$

Step 3

Add the products.

$$\begin{array}{r} 24 \\ \times 45 \\ \hline 120 \\ + 960 \\ \hline 1,080 \end{array}$$

So, the animator creates 1,080 pictures to make a 45-second cartoon.

Example 2

Multiply by the standard algorithm.

a. 38×17

b. 86×54

Solution



a.

$$\begin{array}{r} 38 \\ \times 17 \\ \hline 266 \leftarrow 7 \times 38 \\ + 380 \leftarrow 10 \times 38 \\ \hline 646 \end{array}$$

b.

$$\begin{array}{r} 86 \\ \times 54 \\ \hline 344 \leftarrow 4 \times 86 \\ + 4,300 \leftarrow 50 \times 86 \\ \hline 4,644 \end{array}$$

Example 3

The greenhouse has 45 bags of potting soil.

Each bag has enough soil to pot 29 plants.

How many plants can be potted?



*Remind your child that although he/she has been learning different strategies for multiplication, mathematicians work towards being efficient in their calculations. It might take a long time to draw an area model to solve a problem, so they may choose to use an algorithm like partial products or the standard algorithm.

Solution

Multiply: 45×29

One Way

Bassem used standard algorithm (regrouping) to find the product.

Bassem

$$\begin{array}{r}
 3 \\
 4 \\
 29 \\
 \times 45 \\
 \hline
 145 \leftarrow (5 \times 29) \\
 + 1,160 \leftarrow (40 \times 29) \\
 \hline
 1,305
 \end{array}$$

Another Way

Amgad used partial products.

Amgad

$$\begin{array}{r}
 29 \\
 \times 45 \\
 \hline
 45 \leftarrow (5 \times 9) \\
 + 100 \leftarrow (5 \times 20) \\
 + 360 \leftarrow (40 \times 9) \\
 + 800 \leftarrow (40 \times 20) \\
 \hline
 1,305
 \end{array}$$

So, there is enough soil to pot 1,305 plants.

Check your understanding

Solve using any strategy.

a. $57 \times 16 =$ _____

b. $24 \times 88 =$ _____

c. $35 \times 62 =$ _____

Notes for parents :

- Help your child make connections between the partial products algorithm, and the standard algorithm for two-digit multiplication. Making these connections helps your child build deep understanding of multiplication processes.

1. Solve using the partial products algorithm.

a. $14 \times 26 =$

x	_____
<hr/>	
+	_____
+	_____
+	_____
<hr/>	

b. $38 \times 75 =$

x	_____
<hr/>	
+	_____
+	_____
+	_____
<hr/>	

c. $55 \times 48 =$

x	_____
<hr/>	
+	_____
+	_____
+	_____
<hr/>	

d. $36 \times 14 =$

x	_____
<hr/>	
+	_____
+	_____
+	_____
<hr/>	

e. $24 \times 43 =$

x	_____
<hr/>	
+	_____
+	_____
+	_____
<hr/>	

f. $44 \times 39 =$

x	_____
<hr/>	
+	_____
+	_____
+	_____
<hr/>	

g. $53 \times 28 =$

x	_____
<hr/>	
+	_____
+	_____
+	_____
<hr/>	

h. $60 \times 18 =$

x	_____
<hr/>	
+	_____
+	_____
+	_____
<hr/>	

i. $89 \times 47 =$

x	_____
<hr/>	
+	_____
+	_____
+	_____
<hr/>	

2. Solve using the standard algorithm.

a. $52 \times 36 =$

×	
<hr/>	
+	
<hr/>	

b. $25 \times 78 =$

×	
<hr/>	
+	
<hr/>	

c. $63 \times 28 =$

×	
<hr/>	
+	
<hr/>	

d. $21 \times 31 =$

×	
<hr/>	
+	
<hr/>	

e. $46 \times 25 =$

×	
<hr/>	
+	
<hr/>	

f. $52 \times 25 =$

×	
<hr/>	
+	
<hr/>	

g. $39 \times 18 =$

×	
<hr/>	
+	
<hr/>	

h. $77 \times 33 =$

×	
<hr/>	
+	
<hr/>	

i. $98 \times 26 =$

×	
<hr/>	
+	
<hr/>	

3. Solve using any method.

a. $14 \times 29 =$

d. $82 \times 45 =$

g. $99 \times 21 =$

b. $67 \times 21 =$

e. $76 \times 15 =$

h. $54 \times 59 =$

c. $43 \times 34 =$

f. $17 \times 32 =$

i. $83 \times 15 =$

4. put (✓) for the correct statement and (X) for the incorrect statement.

a. $35 \times 11 = 385$

()

b. $86 \times 42 = 3,512$

()

c. $67 \times 75 = [67 \times 5] + [67 \times 7]$

()

d. $18 \times 32 = 1,832$

()

5. Use "> , < , or =" for each .

a. 25×44 1,200

b. 50×40 2,000

c. 18×25 30×15

d. $[35 \times 7] + [35 \times 10]$ 35×71

e. 44×3 33×4

f. 23×40 92

6. What's the Error?

Maged says the product of 84 and 25 is 210. Is he correct? Explain.

7. What's the Error? Describe

Eman's error: Write the correct answer.

○○○○○○○○○○○○○○	
Eman	
	64
×	43
<hr/>	
	192
+	256
<hr/>	
	448

8. Mariam ordered 47 binders for her office.

Each binder costs 15 L.E.

How much did the binders cost in all?



Multy steps story problems

9. Answer the following.

a. Which costs more, 23 off-road buggies or 21 sport cars? How much more?



b. Malik walked 8 kilometers on Friday and 6 kilometers on Saturday. He did this every weekend for 6 weeks. How many kilometers did he walk by the end of 6 weeks?



c. Aya paints pictures and sells them at art shows.


She charges 56 L.E. for a large painting. She charges 24 L.E. for a small painting. Last month she sold six large paintings and three small paintings.

How much did she make in all?




- d. A merchant bought 26 boxes of soft drinks for 88 L.E. each, and 46 boxes of sweets for 57 each.
How much money did the merchant pay?



- e.  The Super Bus has a total of 75 seats. The Super Rail seats are 3 times as many people as the Super Bus and 53 more people than the Super Ferry. How many people do the Super Bus, Super Rail, and Super Ferry seat all together?



- f.  On Thursday, the Meat King Market sold 210 kilograms of ground beef. On Friday, it sold twice that amount. On Saturday, it sold only 130 kilograms. How much more meat did the market sell on Friday than on Saturday?

Challenge

10. Find the missing numbers. Explain.



$$\begin{array}{r}
 35 \\
 \times 6\Box \\
 \hline
 1\Box5 \\
 + 2,100 \\
 \hline
 2,275
 \end{array}$$

Multiple Choice Questions

Choose the correct answer.

1. $93 \times 14 =$

A. 1,209

B. 1,496

C. 1,302

D. 2,512

2. $66 \times 22 =$

A. 1,212

B. 1,452

C. 2,266

D. 2,662

3. 15×24



40×90

A. >

B. =

C. <

4. What is the ones digit in the product of 34×27 ?

A. 8

B. 7

C. 5

D. 4

5. What is the first partial product when you multiply 27×18 ?

A. 160

B. 200

C. 70

D. 56

6. What is the last partial product when you multiply 73×28 ?

A. 14

B. 140

C. 1,400

D. 14,000

7. Ali bought 18 shrubs to plant in his garden. Each shrub cost L.E. 14. How much did the shrubs cost in all?

A. L.E. 32

B. L.E. 252

C. L.E. 324

D. L.E. 462

8. Choose the closest number to the correct answer without performing the multiplication operation.

a. 29×31

A. 500

B. 600

C. 900

D. 1,200

b. 42×18

A. 400

B. 500

C. 700

D. 800

c. 83×54

A. 4,000

B. 5,000

C. 8,000

D. 14,000

Concept 1 Assessment | Unit 7



1. Put (✓) to the correct answer and (X) to the incorrect answer.

a. $5 \times 478 = [5 \times 400] + [5 \times 70] + [5 \times 8]$

[]

b. $25 \times 36 = 800$

[]

c. $17 \times 4 = 68$

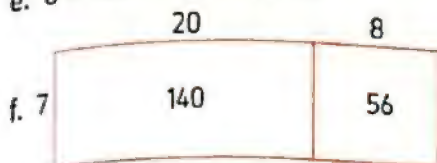
[]

d. $3 \times 256 = 768$

[]

e. $8 \times 125 = 9 \text{ hundreds}$

[]



, the area model represents 7×82

[]

2. Choose the correct answer.

a. Which choice correctly uses the distributive property of multiplication to find the product of 429×7 ?

A. $[4 \times 7] + [2 \times 7] + [9 \times 7]$

B. $[400 \times 7] + [20 \times 7] + [9 \times 7]$

C. $[4 + 7] \times [2 + 7] \times [9 + 7]$

D. $[400 + 7] \times [20 + 7] \times [9 + 7]$

b. Which partial products can be used to solve 48×4 ?

A. $160 + 12$

B. $80 + 32$

C. $160 + 32$

D. $80 + 12$

c. What is the unknown value in the multiplication problem?

5	4	7
\times		8
<hr/>		
?	3	76

A. 2

B. 4

C. 5

D. 9

d. What is the missing value in the area model representing 29×16 ?

A. 19

B. 90

C. 30

D. 200

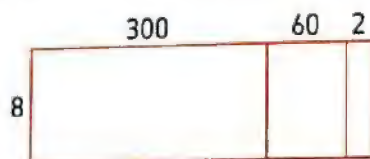
	10	6
20	200	120
9	?	54

- e. Which partial products model represents this multiplication problem?

$$\begin{array}{r} 34 \\ \times 14 \\ \hline 136 \\ 340 \\ \hline 476 \end{array}$$

- A. $[4 \times 4] + [4 \times 10] + [40 \times 4] + [30 \times 10]$
 B. $[4 + 4] + [4 + 10] + [30 + 4] + [30 + 10]$
 C. $[4 \times 4] + [4 \times 30] + [10 \times 4] + [10 \times 30]$
 D. $[4 + 4] \times [4 + 30] \times [10 + 4] \times [10 + 30]$

- f. What is the correct way to use the area model to multiply 362×8 ?



- A. $[300 \times 8] + [60 \times 8] + [2 \times 8]$
 B. $[360 \times 2] + [62 \times 8]$
 C. $[300 \times 8] \times [60 \times 8] \times [2 \times 8]$
 D. $[360 \times 8] \times [2 \times 8]$

3. Complete.

a.

$$\begin{array}{r} \square \\ 54 \\ \times 6 \\ \hline \square \square \square \end{array}$$

b.

$$\begin{array}{r} \square \square \\ 322 \\ \times 7 \\ \hline \square \square \square \square \end{array}$$

c.

$$\begin{array}{r} 49 \\ \times 26 \\ \hline \\ + \quad \quad \\ \hline \end{array}$$

d.

$$\begin{array}{r} 19 \\ \times 82 \\ \hline \\ + \quad \quad \\ \hline \end{array}$$

e. $62 \times 9 =$ _____

f. $58 \times 23 =$ _____

4. Put ">", "<" or "=".

a. 6×35 ○ $[30 \times 6] \times [5 \times 6]$

b. 167×4 ○ $400 + 240 + 28$

c. 29×31 ○ 28×32

d. 8×375 ○ 15×20

5. Multiply 46×7
6. Find the product of 38×18
7. Use the area model to solve 9×154
8. How can you tell what the ones digit of the product of 54×6 will be without solving the whole problem?
9. Amal says "To find 4×13 , I can add 12 and 40"
Do you agree or disagree? Explain.
10. How can you tell that 5×76 will be at least 3 digits?
11. Bassem reads books in a series of mysteries. Each book has 128 pages.
How many pages will Bassem read if he finishes 9 of these books?
12. Eslam's school has 26 classrooms. If each class donates 52 cans of food to charity, how many cans will be donated?



Concept

2

Dividing by 1-Digit Divisors



Fast Fact

Cheetah is the fastest land animal in the world. A cheetah can reach **112 kilometers** per hour.

If a cheetah ran for quarter an hour at its fastest speed, how far could it run?

Concept Overview

In concept 2 :

Dividing by One-Digit Divisors, students build on their learning in primary 3 to deepen and extend their understanding of division and improve their procedural fluency. They explore three different strategies for multiplying the area model strategy, the partial products algorithm, and the standard algorithm. They apply their knowledge of place value, patterns when dividing multiples of 10 by one-digit numbers, and multiplication facts to solve division problems. They use the relationship between multiplication and division to check quotients. Good mathematicians make connections between mathematical concepts and use those connections to solve problems. This concept encourages that practice. Students end the concept by solving challenging story problems involving all four operations.

Lesson No.	Lesson Name	Vocabulary Terms	Learning Objectives
Lesson 5	7-10 Exploring Remainders	Dividend - Divisor - Quotient - Remainder	<ul style="list-style-type: none"> • Students will identify the dividend, divisor, and quotient of a division problem. • Students will solve division problems. • Students will explain what a remainder represents in a division problem.
Lesson 6	7-11 Patterns and Place Value in Division	Dividend - Divisor - Quotient - Remainder	<ul style="list-style-type: none"> • Students will use place value, multiplication facts, and patterns with zeros to divide multiples of 10, 100 and 1,000 by one-digit divisors.
Lesson 7	7-12 The Area Model and Division	Area model - Dividend - Divisor - Quotient - Remainder	<ul style="list-style-type: none"> • Students will use area models to represent and solve division problems.
Lesson 8	7-13 The Partial Quotients Algorithm	Partial quotients algorithm	<ul style="list-style-type: none"> • Students will use the partial quotients algorithm to divide dividends with up to four digits by one-digit divisors.
	7-14 The Standard Division Algorithm	Standard algorithm - Regroup	<ul style="list-style-type: none"> • Students will estimate quotients using properties of place value and patterns in multiplication and division. • Students will use the standard algorithm to solve division problems.
Lesson 9	7-15 Division and Multiplication	Accuracy - Reasonable - Regroup	<ul style="list-style-type: none"> • Students will use properties of place value to accurately record quotients. • Students will use the relationship between multiplication and division to check the accuracy of quotients.
	7-16 Solving Challenging Story Problems	Review vocabulary as needed	<ul style="list-style-type: none"> • Students will organize information in story problems to determine when to add, subtract, multiply or divide. • Students will solve story problems using addition, subtraction, multiplication and division.

7-10 Exploring Remainders

Learn

Three friends are playing a game of dominoes. There are 28 dominoes in the set. If each player receives the same number of dominoes, how many dominoes will each player get? How many dominoes will be left over?

- This problem would be solved using **division**. Sometimes a number cannot be divided evenly. The amount left over is called the **remainder**.

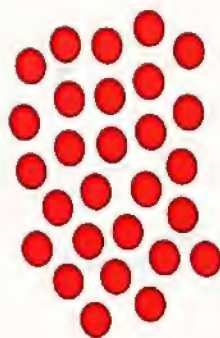


Divide: 28 by 3.

Write $28 \div 3$

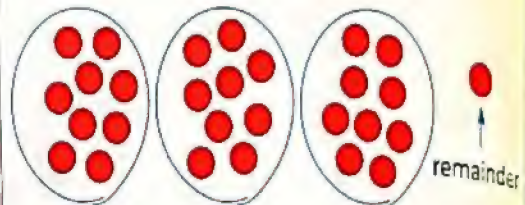
Step 1

Use 28 counters



Step 2

Draw 3 circles. Divide the 28 counters into 3 equal groups. The counter left over is the remainder.



The quotient is 9 and the remainder is 1

Then: $\underset{\substack{\uparrow \\ \text{dividend}}}{28} \div \underset{\substack{\uparrow \\ \text{divisor}}}{3} = \underset{\substack{\uparrow \\ \text{quotient}}}{9} \underset{\substack{\uparrow \\ \text{remainder}}}{R1}$

So, each player will get 9 dominoes. There will be 1 domino left over.

Math Hint

The sum of the digit 2 and 8 is 10 and 10 is not existing when skip counting by 3s so, there will be a remainder.

Note that

If the number is divided equally, the remainder is 0

Examples: $27 \div 3 = 9 R 0$
 $40 \div 8 = 5 R 0$

If the remainder is greater than the divisor, keep dividing the counters evenly until the remainder is less than the divisor.

ERROR
ALERT



Notes for parents :

- Ask your child what the numbers in the equation represent in the problem. Label the numbers in the equation with the correct vocabulary words.

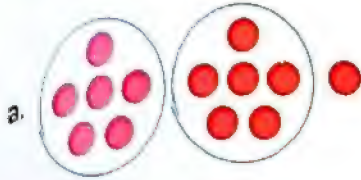

Example 1

Find the quotient and the remainder. You may use counters to model.

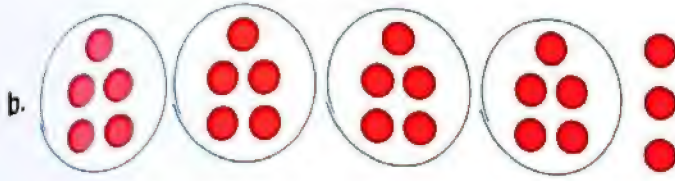
a. $13 \div 2$

b. $23 \div 4$

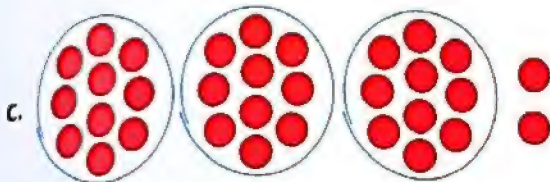
c. $32 \div 3$

Solution 

$13 \div 2 = 6 \text{ R } 1$



$23 \div 4 = 5 \text{ R } 3$



$32 \div 3 = 10 \text{ R } 2$

**Remember**

Division is the inverse of multiplication

$2 \times 6 = 12$

$12 \div 2 = 6$

So

$13 \div 2 = 6 \text{ R } 1$

because $13 = (2 \times 6) + 1$

Note that 

The remainder is always less than the divisor.

Example 2

There are 62 students in fourth grade in a school. Each table in the library room seats six students. How many tables are needed to seat all fourth graders?

Solution This problem would be solved using division $62 \div 6 = 10 \text{ R } 2$ 11 tables are needed [10 tables will be filled and one more table is needed for the 2 extra students] So, $10 + 1 = 11$ tables are needed.**Check** your understanding

Find the quotient and the remainder. You may use counters to model.

a. $17 \div 5$

b. $26 \div 6$

c. $9 \div 2$

* Your child may be confused by having a remainder in a division problem. He/She may try to place the remainder into an existing group or into an additional group, both leading to unequal sharing.

Exercise 38

7-10 Exploring Remainders

REMEMBER

UNDERSTAND

APPLY

PROBLEM SOLVING

From the school book

1. Find the quotient and the remainder. Complete the table, you may use counters to model.

	Problem	Quotient	Remainder	Model
a.	$15 \div 6$			
b.	$5 \div 4$			
c.	$38 \div 5$			
d.	$22 \div 7$			
e.	$26 \div 3$			
f.	$17 \div 9$			

2. Find each quotient and remainder. Complete the following.

a. $11 \div 3 = \square \text{ R } \square$

b. $7 \div 2 = \square \text{ R } \square$

c. $26 \div 4 = \square \text{ R } \square$

d. $51 \div 8 = \square \text{ R } \square$

e. $20 \div 9 = \square \text{ R } \square$

f. $12 \div 5 = \square \text{ R } \square$

3. Find each quotient and remainder. you may use counters to help you.

a. $13 \div 2 = \underline{\hspace{2cm}}$

b. $18 \div 7 = \underline{\hspace{2cm}}$

c. $30 \div 4 = \underline{\hspace{2cm}}$

d. $22 \div 6 = \underline{\hspace{2cm}}$

e. $42 \div 8 = \underline{\hspace{2cm}}$

f. $57 \div 7 = \underline{\hspace{2cm}}$

g. $26 \div 5 = \underline{\hspace{2cm}}$

h. $93 \div 9 = \underline{\hspace{2cm}}$

i. $35 \div 6 = \underline{\hspace{2cm}}$

4. Find each quotient and remainder. Circle all the problems which has 0 left over.

a. $20 \div 7 =$ _____

b. $18 \div 9 =$ _____

c. $31 \div 8 =$ _____

d. $72 \div 9 =$ _____

e. $51 \div 5 =$ _____

f. $22 \div 2 =$ _____


g. $44 \div 6 =$ _____

h. $24 \div 3 =$ _____

i. $65 \div 10 =$ _____


5. Solve the following problems.

- a. A box can hold 6 basketballs. There are 50 basketballs. How many boxes can be filled?
How many boxes are needed to hold all the basketballs?

- b.  Saleem brought 15 pies to give to 4 of his friends. How can Saleem share the pies equally? What is left?

- c. Rose has 19 biscuits to give to her 9 friends.
How can Rose share the biscuits equally? What is left?

- d. A full box of crayons contains 8 crayons. If each of the 42 students in a class needs to use 1 crayon at the same time in a class activity.
How many boxes of crayons are needed for all the students?

- e.  There are 48 mugs that need to be put in boxes and shipped. Five mugs can fit in each box. How many boxes will be needed to ship the mugs?

- f. There are 30 students in primary stage going to the big game against another school students. If 4 students can ride in one car, how many cars do they need?

- g. Going to a Swim Meet. The swim team is taking a bus to a swim meet. Each bus seats 40 students. Sixty students will attend the meet. How many buses are needed? Use numbers, words, and symbols to explain your thinking.

- h. Thirty-two people need to travel to a special event in Zamalek. There are many different ways they can travel to the event. They can only choose one of the ways to travel for the whole group of people. Look at all of the forms of transportation they can take on the chart.

Form of transportation	How many people can fit on each?	Equation
Microbus	9	
Motorbike	2	
Car	4	
Van	7	

Which form of transportation should the group take to the event? Explain your answer.



Challenge

6. Each page of Ahmed's album holds 4 photographs. He filled all 9 pages and still had 3 photos left over.

How many photos did Ahmed have to start with?

Multiple Choice Questions

Choose the correct answer:

1. The amount that is left over when a number cannot be divided evenly is called _____
 A. dividend B. divisor
 C. quotient D. remainder

2. The number, not including the remainder, that results from dividing is called _____
 A. dividend B. divisor
 C. quotient D. product

3. $11 \div 3 =$ _____
 A. 3 R1 B. 4 R1
 C. 3 R2 D. 4 R2

4. $28 \div 6 =$ _____
 A. 5 R2 B. 4 R4
 C. 5 R4 D. 4 R2

5. $46 \div 8 =$ _____
 A. 4 R6 B. 4 R8
 C. 5 R6 D. 5 R8

6. $36 \div 4 =$ _____
 A. 8 R3 B. 9 R1
 C. 9 R2 D. 9 R0

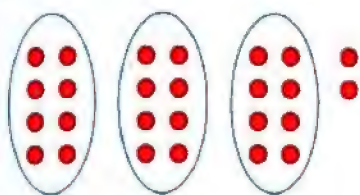
7. $52 \div 7 =$ _____
 A. 7 R1 B. 7 R2
 C. 7 R3 D. 7 R4

8. $5 \div 3 =$ _____
 A. 1 R0 B. 1 R1
 C. 1 R2 D. 1 R3

9. $27 \div 9 =$ _____
 A. 2 R8 B. 3 R1
 C. 3 R0 D. 3 R8

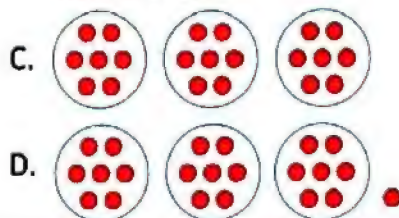
10. $25 \div 2 =$ _____
 A. 12 R0 B. 12 R1
 C. 13 R0 D. 13 R1

11. Which division problem does the model show?



- A. $24 \div 3 = 8$ B. $23 \div 3 = 7 \text{ R } 2$
 C. $26 \div 3 = 8 \text{ R } 2$ D. $21 \div 3 = 7$

12. Which of the following shows $22 \div 3$?



13. Mary cooked 32 cups of soup and poured it into containers that filled up with 6 cups each. How many cups of soup were left over?
 A. 2 cups. B. 4 cups.
 C. 5 cups. D. 6 cups.

14. Ramez is packing 54 muffins in boxes. Each box contains 5 muffins. How many boxes are needed to pack all the muffins?
 A. 9 boxes. B. 10 boxes.
 C. 11 boxes. D. 12 boxes.

Lesson 6

7-11 Patterns and Place Value in Division

Learn

Sara's family collected coins, when the jar was full, Sara's father gave the coins to his three daughters.

They counted 6,000 coins and shared them equally.

How many coins did each girl get?



Divide : $6,000 \div 3$.

Basic facts, pattern and place value can help you divide.

Use the basic fact $6 \div 3 = 2$.

$$6 \div 3 = 2$$

$$60 \div 3 = 20$$

$$600 \div 3 = 200$$

$$6,000 \div 3 = 2,000$$

Three zeroes

Three zeroes

What do you notice about the pattern of zeroes?



So, each girl got 2,000 coins.



Remember

$$6 \div 3 = 2$$

6 is called the dividend
3 is called the divisor
2 is called the quotient

More Examples :

$$32 \div 8 = 4$$

$$320 \div 8 = 40$$

$$3,200 \div 8 = 400$$

$$32,000 \div 8 = 4,000$$

$$40 \div 5 = 8$$

$$400 \div 5 = 80$$

$$4,000 \div 5 = 800$$

$$40,000 \div 5 = 8,000$$

$$63 \div 7 = 9$$

$$630 \div 7 = 90$$

$$6,300 \div 7 = 900$$

$$63,000 \div 7 = 9,000$$

Notes for parents :

- Your child may only look at the place with the highest value and try to divide. For example, with $2,400 \div 3$, he/she may try to solve $2 \div 3$ instead of $24 \div 3$.

Example 1

Use patterns to find the quotient.

a. $8 \div 2 =$

$80 \div 2 =$

$800 \div 2 =$

$8,000 \div 2 =$

b. $15 \div 5 =$

$150 \div 5 =$

$1,500 \div 5 =$

$15,000 \div 5 =$

c. $20 \div 4 =$

$200 \div 4 =$

$2,000 \div 4 =$

$20,000 \div 4 =$

Solution 

a. 4

40

400

4,000

b. 3

30

300

3,000

c. 5

50

500

5,000

Example 2

Write the basic fact that you can use to solve these problems. Then solve each problem.

	Problem	Basic Fact	Quotient
a.	$90 \div 3$		
b.	$160 \div 2$		
c.	$5,500 \div 5$		
d.	$1,000 \div 2$		

Solution 

	Problem	Basic Fact	Quotient
a.	$90 \div 3$	$9 \div 3 = 3$	30
b.	$160 \div 2$	$16 \div 2 = 8$	80
c.	$5,500 \div 5$	$55 \div 5 = 11$	1,100
d.	$1,000 \div 2$	$10 \div 2 = 5$	500

*Your child may be confused by how many zeroes to put in a quotient, especially when the basic fact includes a zero. For example, the basic fact for $2,000 \div 4$ is $20 \div 4 = 5$. The quotient is 500 since there are two other zeroes in the dividend.

Example 3

Complete each missing number.

a. $140 \div 7 = \square$

b. $35,000 \div 5 = \square$

c. $\square \div 3 = 100$

d. $280 \div \square = 40$

e. $\square \div 8 = 30$

f. $3,200 \div \square = 800$

Solution 

a. 20

b. 7,000

c. 300

d. 7

e. 240

f. 4

 Check your understanding

1. Use patterns and place value to find each quotient.

a. $8 \div 4 = \square$

b. $18 \div 9 = \square$

c. $3 \div 3 = \square$

$80 \div 4 = \square$

$180 \div 9 = \square$

$30 \div \square = 10$

$800 \div 4 = \square$

$1,800 \div 9 = \square$

$\square \div 3 = 100$

$8,000 \div 4 = \square$

$18,000 \div 9 = \square$

$3,000 \div 3 = \square$

2. How can you use $16 \div 4 = 4$ to help you find $160 \div 4$?

Notes for parents :

- Make sure your child recognize that the number of zeroes in the dividend is the same as the number of zeroes in the quotient unless the basic fact has a zero in it.

Exercise 39

7-11 Patterns and Place Value in Division

REMEMBER

EXERCISES

APPLY

PROBLEM SOLVING

From the school book

1. Use patterns and place value to find each quotient.

a. $6 \div 2 = \square$

$60 \div 2 = \square$

$600 \div 2 = \square$

$6,000 \div 2 = \square$

b. $18 \div 3 = \square$

$180 \div 3 = \square$

$1,800 \div 3 = \square$

$18,000 \div 3 = \square$

c. $42 \div 6 = \square$

$420 \div 6 = \square$

$4,200 \div 6 = \square$

$42,000 \div 6 = \square$

d. $7 \div 7 = \square$

$70 \div 7 = \square$

$700 \div 7 = \square$

$7,000 \div 7 = \square$

e. $32 \div 8 = \square$

$320 \div 8 = \square$

$3,200 \div 8 = \square$

$32,000 \div 8 = \square$

f. $63 \div 9 = \square$

$630 \div 9 = \square$

$6,300 \div 9 = \square$

$63,000 \div 9 = \square$

2. **Division Patterns** Label the parts in the equation using the words divisor, dividend, and quotient. Then, look for patterns to complete the remaining problems. The first problem in the table is an example that is filled in for you.

Equation	Basic (Related) Fact	Quotient
$600 \div 3$	$6 \div 3 = 2$	200
$150 \div 5$		
$1,200 \div 6$		
$200 \div 4$		
$700 \div 7$		
$6,400 \div 8$		
$4,500 \div 9$		
$270 \div 3$		

3. Find the quotient. Use basic facts and place value patterns to help you divide.

a. 4 ones $\div 2 =$ _____ ones

$4 \div 2 =$ _____

4 tens $\div 2 =$ _____ tens

$40 \div 2 =$ _____

4 hundreds $\div 2 =$ _____ hundreds

$400 \div 2 =$ _____

4 thousands $\div 2 =$ _____ thousands

$4,000 \div 2 =$ _____

b. 3 ones $\div 3 =$ _____ ones

$3 \div 3 =$ _____

3 tens $\div 3 =$ _____ tens

$30 \div 3 =$ _____

3 hundreds $\div 3 =$ _____ hundreds

$300 \div 3 =$ _____

3 thousands $\div 3 =$ _____ thousands

$3,000 \div 3 =$ _____

c. 24 ones $\div 8 =$ _____ ones

$24 \div 8 =$ _____

24 tens $\div 8 =$ _____ tens

$240 \div 8 =$ _____

24 hundreds $\div 8 =$ _____ hundreds

$2,400 \div 8 =$ _____

24 thousands $\div 8 =$ _____ thousands

$24,000 \div 8 =$ _____

d. 42 ones $\div 6 =$ _____ ones

$42 \div 6 =$ _____

42 tens $\div 6 =$ _____ tens

$420 \div 6 =$ _____

42 hundreds $\div 6 =$ _____ hundreds

$4,200 \div 6 =$ _____

42 thousands $\div 6 =$ _____ thousands

$42,000 \div 6 =$ _____

4. Find each quotient.

a. $27 \div 3 =$ _____

d. $720 \div 8 =$ _____

g. $3,600 \div 6 =$ _____

j. $6,400 \div 8 =$ _____

m. $30,000 \div 6 =$ _____

b. $54 \div 9 =$ _____

e. $180 \div 2 =$ _____

h. $4,900 \div 7 =$ _____

k. $4,000 \div 5 =$ _____

n. $81,000 \div 9 =$ _____

c. $120 \div 6 =$ _____

f. $450 \div 5 =$ _____

i. $3,200 \div 4 =$ _____

l. $2,100 \div 7 =$ _____

o. $24,000 \div 4 =$ _____

5. Complete the missing numbers.

a. $18 \div \square = 6$

d. $70 \div \square = 10$

g. $1,600 \div \square = 800$

j. $\square \div 9 = 9,000$

m. $\square \div 5 = 5,000$

b. $120 \div \square = 20$

e. $\square \div 3 = 30$

h. $3,200 \div \square = 400$

k. $\square \div 3 = 8,000$

n. $\square \div 6 = 8,000$

c. $630 \div \square = 90$

f. $\square \div 4 = 700$

i. $4,500 \div \square = 500$


l. $\square \div 1 = 9,000$

o. $\square \div 7 = 6,000$

6. Solve the following problems.

- a. Mrs. Farida's class is 60 minutes long. She wants to divide her class time into 3 equal periods. How long will each period be?

- b. Bassem is reading a book of 180 pages. If he reads 9 pages per day, how long will it take him to finish the book?

- c.  There were 540 crayons in a large bin. Students were asked to put 9 crayons in a small box for each student to use. How many small boxes will students need in order to complete this task?

- d. At a primary school, the students collected 3,000 pounds as a donation to kids Hospital. Each student donated 5 pounds. How many students donated?

- e.  **Riding the Metro**

There are 8,100 people that need to get to work on Monday morning at 7:00 a.m. They all want to take the Metro to work. There are 9 cars on each Metro. If 90 people can fit in each car, can all the people take the same metro to work? Explain your thinking using numbers, words and symbols.

- f. A factory produced 54,000 pieces of toys in 9 months. The factory produced the same number of pieces each month.

How many pieces did the factory produce per month?

Challenge

7. A class wants to plant 450 flowers for Earth Day, in equal rows. If they plant 50 rows.
How many flowers are in each row?

Multiple Choice Questions

Choose the correct answer.

1. $80 \div 2 =$ _____

- A. 4
- B. 40
- C. 400
- D. 160

3. $160 \div 4 =$ _____

- A. 4
- B. 40
- C. 400
- D. 4,000

5. $4,200 \div 7 =$ _____

- A. 6
- B. 60
- C. 600
- D. 6,000

7. $63,000 \div 9 =$ _____

- A. 7
- B. 70
- C. 700
- D. 7,000

9. $320 \div \text{_____} = 40$

- A. 8
- B. 80
- C. 800
- D. 8,000

11. $\text{_____} \div 7 = 300$

- A. 21
- B. 210
- C. 2,100
- D. 21,000

13. $63 \text{ tens} \div 7 = \text{_____ tens}$

- A. 9
- B. 90
- C. 900
- D. 9,000

2. $400 \div 8 =$ _____

- A. 5
- B. 50
- C. 500
- D. 5,000

4. $3,000 \div 3 =$ _____

- A. 1
- B. 10
- C. 100
- D. 1,000

6. $2,000 \div 5 =$ _____

- A. 4
- B. 40
- C. 400
- D. 4,000

8. $56 \div 7 =$ _____

- A. 8
- B. 80
- C. 800
- D. 8,000

10. $3,500 \div \text{_____} = 700$

- A. 2
- B. 3
- C. 4
- D. 5

12. $\text{_____} \div 6 = 4,000$

- A. 24
- B. 240
- C. 2,400
- D. 24,000

14. $27 \text{ hundreds} \div 9 = \text{_____}$

- A. 30 hundreds
- B. 3 tens
- C. 30 tens
- D. 300 tens

$$1200 \div 3 = 400$$

$$1200 \div 3 = 400$$

$$1200 \div 3 = 400$$

$$1200 \div 3 = 400$$

$$1200 \div 3 = 400$$

$$1200 \div 3 = 400$$

$$1200 \div 3 = 400$$

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$$1200 \div 3 = 400$$

$$1200 \div 3 = 400$$

$$1200 \div 3 = 400$$

9. Which pattern can you identify in the following division problems?

$$1200 \div 3 = 400$$

$$1200 \div 3 = 400$$

$$1200 \div 3 = 400$$

A. The dividends are multiples of 10.

B. The dividends are multiples of 100.

C. The dividends are multiples of 1000.

D. The dividends are multiples of 10000.

10. Ramesh wants to give 500 marbles from his marble collection to 4 of his friends. He wants to give each friend the same number of marbles.

How many marbles will each friend receive?

A. 50 marbles.

B. 500 marbles.

C. 500 marbles.

D. 500 marbles.

Lesson 7

7-12 The Area Model and Division

Learn

Bassem's family drove 615 kilometers in 3 days. They drove the same number of kilometers every day.

How many kilometers did they drive per day?

Divide : $615 \div 3$

You can use an area model for division.



Step 1

Draw a long rectangle and write 3 on the smaller left side of the rectangle.



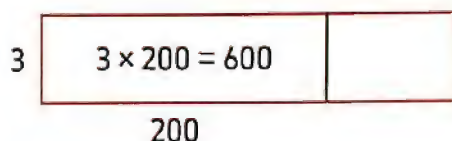
Think

$$615 = 600 + 15$$

Step 2

Since $3 \times 200 = 600$, then 600 is a multiple of 3 which is the divisor in this problem.

Draw a vertical line inside the rectangle. Write $3 \times 200 = 600$ inside the section of the model and 200 underneath.

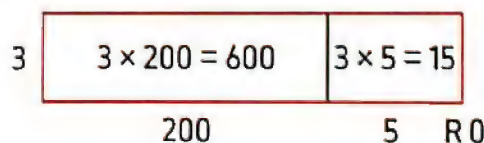


Remember

Area of rectangle
= length \times width

Step 3

Since $3 \times 5 = 15$, then 15 is a multiple of 3 which is the divisor in this problem. Write $3 \times 5 = 15$ inside the empty section of the model and 5 underneath.



Notes for parents :

- Your child may get confused with how many zeroes to place at the end of a product. For example, he/she may write $7 \times 3,000 = 2,100$ instead of $7 \times 3,000 = 21,000$. Your child may also write $4 \times 500 = 200$ instead of $4 \times 500 = 2,000$

Example 2

Check your answers and there is no left over.

Add the areas: $600 + 15 = 615$

$R\ 0$ (no remainder)

Add the miles: $200 + 5 = 205$

then $615 \div 3 = 205$

They drove 205 kilometers per day for 3 days.

**Example 1**

There are 548 pencils will be shared among 5 classrooms. How many pencils will each classroom get?

Solution

Divide: $548 \div 5$

Use an area model for division.

Think

$$548 = 500 + 48$$

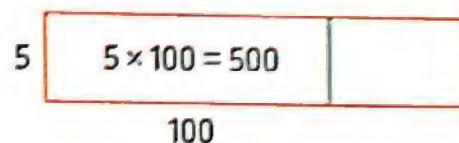
Step 1

Draw a long rectangle and write 5 on the smaller left side of the rectangle.

**Step 2**

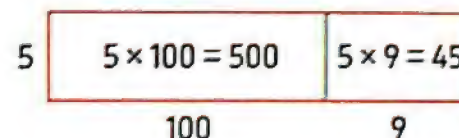
Since $5 \times 100 = 500$, draw a vertical line inside the rectangle.

Write $5 \times 100 = 500$ inside the section of the model and 100 underneath.

**Step 3**

There are 48 pencils left to be divided known that $5 \times 10 = 50$ and $5 \times 9 = 45$

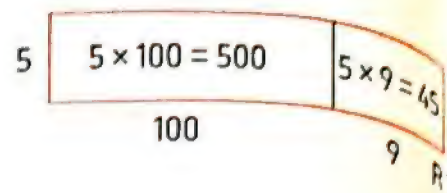
So, write $5 \times 9 = 45$ inside the empty section of the model and 9 underneath.



*Your child may have difficulty determining which multiples to use to start decomposing a dividend when using an area model. It is most effective and efficient to start with multiplying the divisor by 10, 100 or 1,000. For example, for $256 \div 8$, it is helpful to begin with $8 \times 10 = 80$ and to work up to 256.

Step 4

Since there are 3 left over not enough to make another group of 5, there is a remainder that is 3.
So, write 3 outside the rectangle next to the area model.



Step 5

Check your answers.

Add the areas and the remainder: $500 + 45 + 3 = 548$

Add the sides and the remainder: $100 + 9 \text{ R } 3 = 109 \text{ R } 3$

then: $548 \div 5 = 109 \text{ R } 3$

So, each class will get 109 pencils and there are 3 pencils left over that cannot be shared evenly among the classes.

Example 2

Draw an area model to solve each problem.

a. $69 \div 3$

b. $825 \div 4$

c. $3,600 \div 6$

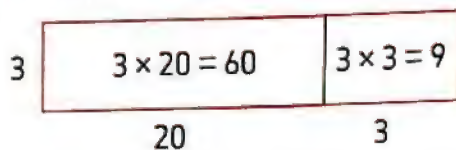


Remember

Check the left over in each problem

Solution

a. **Think:** $69 = 60 + 9$

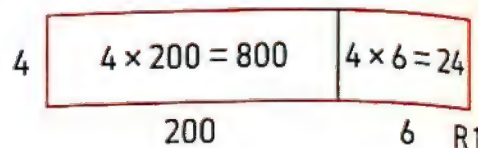


Add the areas: $60 + 9 = 69 \text{ R } 0$ (no remainder)

Add the sides: $20 + 3 = 23$

So, $69 \div 3 = 23$

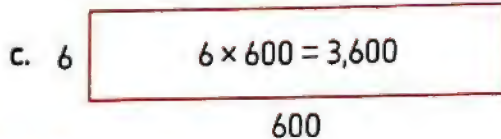
b. **Think:** $825 = 800 + 25$, $25 = 24 + 1$



Add the areas: $800 + 24 + \text{R } 1 = 825$

Add the sides: $200 + 6 \text{ R } 1 = 206 \text{ R } 1$

So, $825 \div 4 = 206 \text{ R } 1$



So, $3,600 \div 6 = 600$ (no remainder)



Check your understanding

Use the area to model the following problem.

$535 \div 5$



Notes for parents :

- Let your child check the left over in each problem.

Exercise 40

7-12 The Area Model and Division

REMEMBER UNDERSTAND APPLY PROBLEM SOLVING

From the school book

1. Use the area model to solve each of the following.

a. $24 \div 2$

b. $85 \div 4$

c. $217 \div 5$

d. $159 \div 3$

e. $636 \div 6$

f. $484 \div 8$

2. Use the area model to solve the problems. Show your work.

a. $48 \div 4$

b. $67 \div 3$

c. $613 \div 3$

d. $810 \div 9$

e. $742 \div 7$

f. $248 \div 6$

g. $455 \div 4$

h. $535 \div 5$


i. $3,200 \div 8$

j. $4,500 \div 9$

3. Solve each problem using an area model.

- a. Sylvia is sharing her muffins. If she shares 63 muffins among 3 groups of people, what is the share of each group?



- b.  An organization donated 89 books to a school.
The books will be shared among 6 classrooms.
How many books will each classroom get?




- c. A factory makes 546 teddy bears. The manufacturers
have boxes that can hold 6 bears each.
How many boxes is needed to hold all the teddy bears?
How many bears will be left over?




- d. Seven classes collected cans for recycling
and made 497 pounds. They agreed to spilt
the money evenly. How much did each class earn?



- e.  Rashida saved 545 L.E. to buy a toy car.
She did this by saving 5 L.E. every day she worked
around her neighborhood. How many days did she
have to work to save enough money to buy a toy car?



- f.  There are 864 pencils. The pencils have to be divided equally among 4 classrooms. How many pencils will each classroom get?




- g. Amgad saved 868 coins last year. He wanted to put them into 8 jars. How many coins will be in each jar? Is there any coins left over?



- h. Osama bought lunch for 6 people. He spent 672 pounds. If each person's lunch cost the same amount. How much did one lunch cost?



- i.  Amir bought a book of stickers. There were 92 stickers in the book. He wanted to give them to 4 of his friends. How many stickers will each of his friends get?

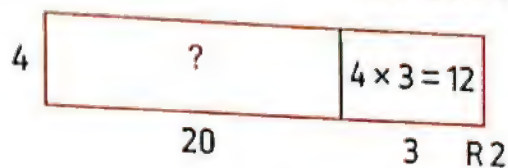


1. **Writing About Math.** There are 492 cars that need to park at the stadium. The stadium has 4 parking lots. The stadium wants the same number of cars to park in each lot. How could you use the previous problem to help you solve $492 \div 4$? Use words, numbers and symbols to explain your thinking.

4. **Critical Thinking.**

- a. How can $96 \div 3$ help you find $696 \div 3$?

- b. Which choice best completes the area model to find $94 \div 4$?



A. $4 \times 2 = 8$

B. $4 \times 20 = 80$

C. $20 + 4 = 24$

D. $4 \times 16 = 20$

Complete: $94 \div 4 =$ _____

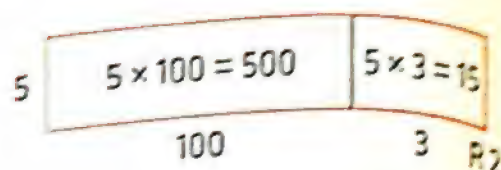
- c. The divisor is 6 and the dividend is 752. **Divide.**

- d. Nine students are sharing marbles equally. If they have 12 marbles, how many marbles will be left over? How many marbles will be left over if there are 112 marbles?

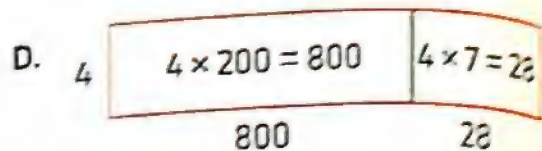
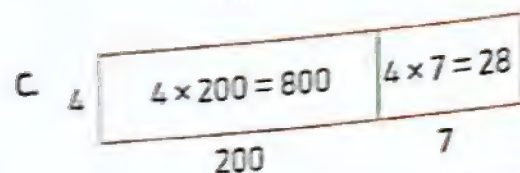
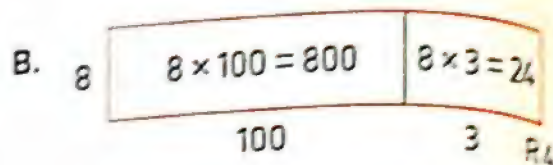
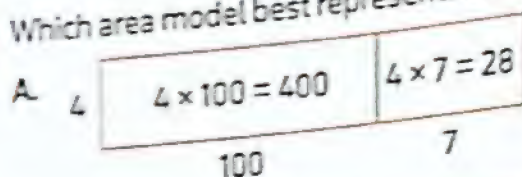
Multiple Choice Questions

Choose the correct answer.

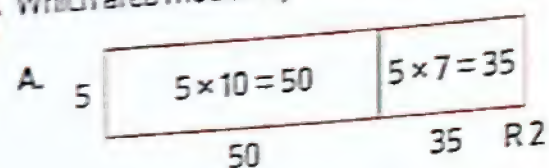
1. In the opposite area model, which choice best represents the problem?
- A. $515 \div 5$
 B. $502 \div 5$
 C. $512 \div 5$
 D. $517 \div 5$



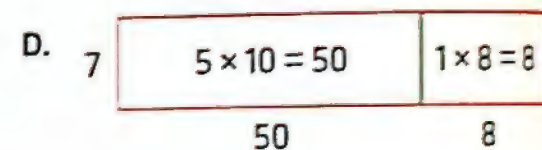
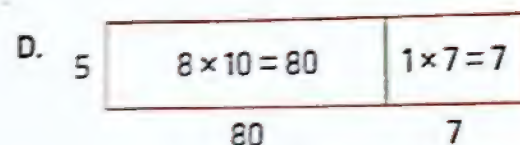
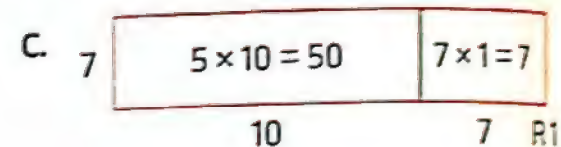
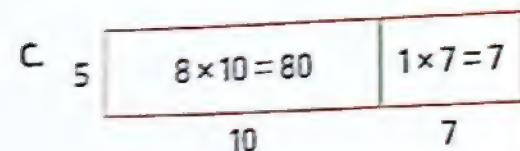
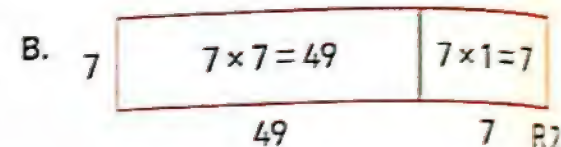
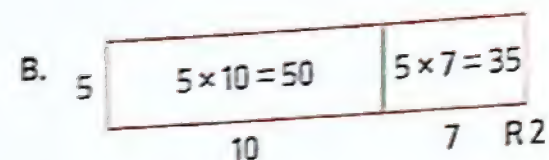
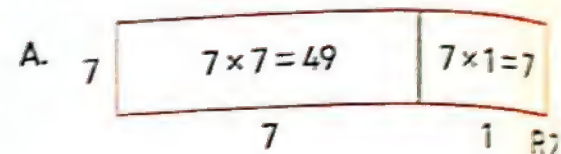
2. Which area model best represents $828 \div 4$?



3. Which area model represents $87 \div 5$?



4. Which area model represents $58 \div 7$?



5. Which number best completes the area model to find $148 \div 6$?

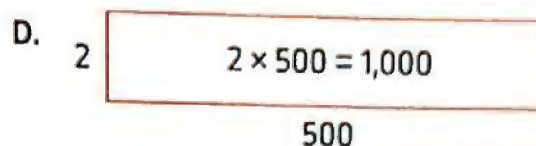
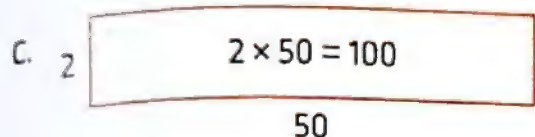
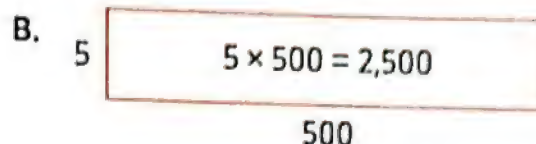
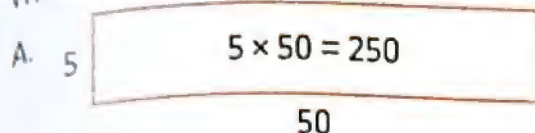


The value of ? is _____

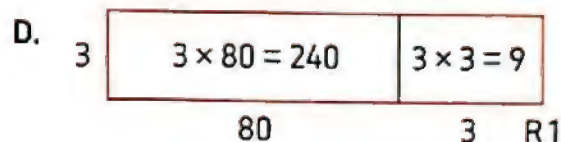
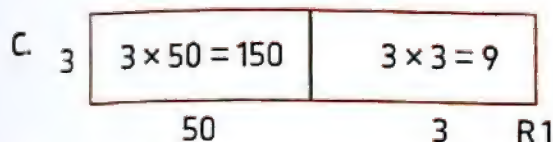
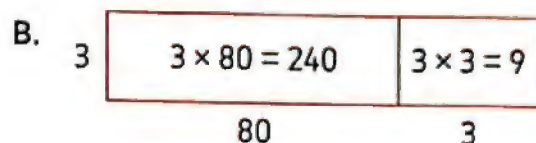
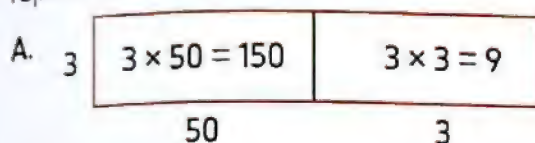
- A. $6 \times 2 = 12$
C. $20 + 4 = 24$

- B. $6 \times 20 = 120$
D. $20 + 4 + 2 = 26$

6. Which area model best represents $2,500 \div 5$?



7. Amir wants to divide 250 pounds among his 3 sons. Which of the following area models represents the problem?



8. $93 \div 4 =$ _____

- A. 25 R3 B. 23 R1
C. 24 R2 D. 21 R3

9. $372 \div 6 =$ _____

- A. 61 R1 B. 61 R5
C. 62 D. 61

10. A chicken farmer uses egg cartons made from recycled material. If 6 eggs fit into each carton, how many cartons will he need for 312 eggs?

- A. 50 cartons B. 51 cartons
C. 52 cartons D. 53 cartons

Lesson 8

7-13 The Partial Quotients Algorithm 7-14 The Standard Division Algorithm

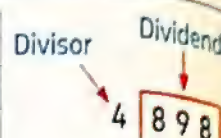
Learn The partial quotients algorithm

Bassem packs the cakes in groups of 4 to sell in his market.
If an order calls for 898 cakes, how many packages will Bassem need?



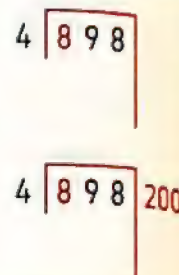
Divide: 898 by 4

1. Draw a line as shown in the figure.

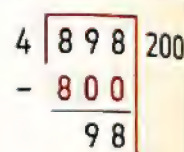


2. Look at the dividend, start from the left there are 8 in the hundreds place = 800

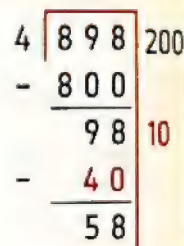
- 800 is a multiple of 4 because $4 \times 200 = 800$
- Then write 200 to the right of the line (part of the quotient).



3. Write 800 under the dividend and subtract from 898, you will get 98.



4. Write a multiple of 4 that is under 98 and subtract (note $4 \times 10 = 40$), then write 10 to the right of the line as a part of quotient.



Notes for parents :

- Remind your child to start division from the left.



5. Repeat writing a multiple of 4 under 58 and subtract (note $4 \times 10 = 40 < 58$) and write 10 as a part of quotient to the right of the line.

$$\begin{array}{r}
 4 \overline{) 898} \quad 200 \\
 - \underline{800} \\
 98 \quad 10 \\
 - \underline{40} \\
 58 \quad 10 \\
 - \underline{40} \\
 18
 \end{array}$$

6. Write a multiple of 4 that is close to 18 (note $4 \times 4 = 16 < 18$), then write 16 under 18 and subtract and write 4 as a part of quotient to the right of the line.

• Then the quotient $= 200 + 10 + 10 + 4$
 $= 224$

• Then $898 \div 4 = 224$ and the remainder $= 2$

Note that

4 does not divide 898 equally because there is a remainder $= 2$

$$\begin{array}{r}
 4 \overline{) 898} \quad 200 \\
 - \underline{800} \\
 98 \quad 10 \\
 - \underline{40} \\
 58 \quad 10 \\
 - \underline{40} \\
 18 \quad 4 \\
 - \underline{16} \\
 2
 \end{array}$$

remainder

Example 1

Divide.

a. $78 \div 6$

b. $658 \div 3$

c. $8,785 \div 7$

Solution 

$$\begin{array}{r}
 6 \overline{) 78} \quad 10 \\
 - \underline{60} \\
 18 \quad 3 \\
 - \underline{18} \\
 0
 \end{array}$$

$$78 \div 6 = 10 + 3 = 13$$

$$\begin{array}{r}
 3 \overline{) 658} \quad 200 \\
 - \underline{600} \\
 58 \quad 10 \\
 - \underline{30} \\
 28 \quad 9 \\
 - \underline{27} \\
 1
 \end{array}$$

$$658 \div 3 = 200 + 10 + 9 = 219$$

and the remainder $= 1$

$$\begin{array}{r}
 7 \overline{) 8,785} \quad 1,000 \\
 - \underline{7,000} \\
 1,785 \quad 200 \\
 - \underline{1,400} \\
 385 \quad 50 \\
 - \underline{350} \\
 35 \quad 5 \\
 - \underline{35} \\
 0
 \end{array}$$

$$8,785 \div 7$$

$$= 1,000 + 200 + 50 + 5 = 1,255$$

* Your child may use any multiple of divisor to divide.

Learn Estimating quotients

Each morning, Ahmed gives a recycling report on his school's television system.

At the school, a team of 6 students picked up 257 recyclable cans and bottles. About how many recyclables per student was that?

- Sometimes you only need to find an estimation. One way to estimate quotients is to substitute numbers that make mental math simpler.
- Mina and Marwan substitute numbers close to 257 to make their mental math simpler.



Mina thinks

$257 \div 6$ is about

$$300 \div 6$$

$$300 \div 6 = 50$$

Each student picked up about 50 cans and bottles.



Marwan thinks

$257 \div 6$ is about

$$240 \div 6$$

$$240 \div 6 = 40$$

That was about 40 cans and bottles per student.



Both estimations are reasonable.

Example 2

Estimate the quotient of $63 \div 4$

Solution

The dividend 63 is between 40 and 80

, then $40 \div 4 = 10$ and $80 \div 4 = 20$

, then the quotient is between 10 and 20

Notes for parents :

- Discuss the purpose of rounding versus using basic facts to estimate by asking your child which method makes the problem easier to calculate mentally. Demonstrate how using a basic fact makes estimating easier for $257 \div 6$ by having your child try to find each of these quotients mentally : $300 \div 6$, $240 \div 6$.

Example 3Estimate the quotient of $524 \div 3$ **Solution** 

The dividend 524 is between 300 and 600

, then $300 \div 3 = 100$ and $600 \div 3 = 200$

, then the quotient is between 100 and 200

Check your understanding

1. Use the partial quotient algorithm to divide.

a. $52 \div 3$



b. $783 \div 5$



c. $7,320 \div 6$



2. Estimate each quotient.

a. $37 \div 4$

b. $587 \div 2$

c. $762 \div 9$

*Make sure your child use basic facts and place-value pattern to divide.

Learn The standard division algorithm

Students in the third, fourth and fifth grades made 525 origami animals to display in the library. If each grade made the same number of animals, how many animals did each grade make?



Origami animals

Origami is the Japanese art of folding paper into different shapes.

Divide : $525 \div 3$ or $3 \overline{) 525}$

Step 1

Divide the hundreds.

Divide $5 \div 3$

$$\begin{array}{r} 1 \\ 3 \overline{) 525} \\ - 3 \\ \hline 2 \end{array}$$

Multiply 1×3
Subtract $5 - 3$
Compare $2 < 3$



Remember

After you divide the hundreds, tens or ones place, the remainder should always be less than the divisor.

Step 2

Bring down the tens. Divide the tens.

$$\begin{array}{r} 17 \\ 3 \overline{) 525} \\ - 3 \\ \hline 22 \\ - 21 \\ \hline 1 \end{array}$$

Bring down the tens.
Divide $22 \div 3$
Multiply 7×3
Subtract $22 - 21$
Compare $1 < 3$

Step 3

Bring down the ones. Divide the ones.

$$\begin{array}{r} 175 \\ 3 \overline{) 525} \\ - 3 \\ \hline 22 \\ - 21 \\ \hline 15 \\ - 15 \\ \hline 0 \end{array}$$

Bring down the ones.
Divide $15 \div 3$
Multiply 5×3
Subtract $15 - 15$
Compare $0 < 3$

Check Multiply

$3 \times 175 = 525$
The product equals the dividend

So, each grade made 175 origami animals.

Other Examples :

a. With a remainder

$168R4$ Check: $168 \times 5 = 840$ Multiply, then add the remainder

$$\begin{array}{r} 5 \overline{) 844} \\ - 5 \\ \hline 34 \\ - 30 \\ \hline 44 \\ - 40 \\ \hline 4 \end{array}$$

4 is less than 5, so it is the remainder.

b. Zero in the dividend

Check: $117 \times 6 = 702$

$$\begin{array}{r} 117 \\ 6 \overline{) 702} \\ - 6 \\ \hline 10 \\ - 6 \\ \hline 42 \\ - 42 \\ \hline 0 \end{array}$$

MATH IDEA

The order of division is as follows:

- Divide
- Multiply
- Subtract
- Compare
- Bring down

Repeat this order until the division is complete.

Notes for parents :

- To help your child remember all steps in the division algorithm, let him/her use the following mnemonic or make up one of his/her own: Don't Make Silly Careless Blunders (Divide. Multiply. Subtract. Compare. Bring down).

Example 4Divide $1,765 \div 4$ **Solution** 

Step 1: Divide, multiply, subtract, compare, bring down.

Step 1

Divide $1 \div 4$
 $1 < 4$
 then write 0
 over 1 and divide
 $17 \div 4$
 Subtract $17 - 16$
 Compare $1 < 4$

Step 2

044
 $4 \overline{) 1,765}$
 $- 16 \downarrow$
 16
 $- 16$
 0
 Bring down the tens
 Bring down 6
 Divide $16 \div 4$
 Multiply 4×4
 Subtract $16 - 16$
 Compare $0 < 4$

Step 3

0441
 $4 \overline{) 1,765}$
 $- 16$
 16
 $- 16 \downarrow$
 05
 4
 1
 Bring down the ones
 Bring down 5
 Divide $5 \div 4$
 Multiply 1×4
 Subtract $5 - 4$
 Compare $1 < 4$
 the remainder = 1

then, $1,765 \div 4 = 441 \text{ R } 1$ **Example 5**Divide: $432 \div 4$ **Solution** 

(Zero in the quotient)

Step 1

Divide the 4 hundreds.

1
 $4 \overline{) 432}$
 $- 4$
 0

Step 2Bring down the 3 tens.
Divide the 3 tens.

10
 $4 \overline{) 432}$
 $- 4 \downarrow$
 03
 $- 0$
 3
 $3 < 4$
 , so write a 0
 in the quotient.

Step 3

Bring down the 2 ones. Divide the 32 ones.

108
 $4 \overline{) 432}$
 $- 4$
 03
 $- 0 \downarrow$
 32
 $- 32$
 0

then, $432 \div 4 = 108$ **Check** your understanding

Divide.

a. $525 \div 5$

b. $685 \div 4$

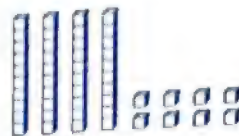

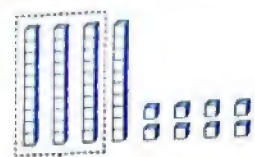
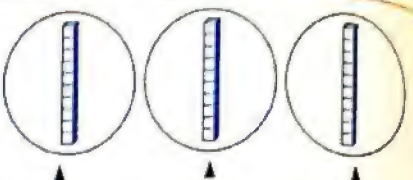
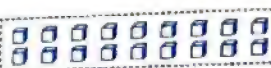
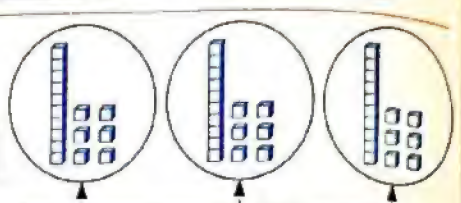
• Remind your child of the division algorithm: divide, multiply, subtract, compare and bring down.

• Remind your child of including the remainder as a part of the answer.

Learn Model Division

Activity 1



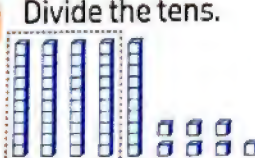
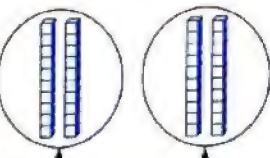

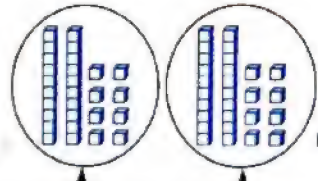
Divide 48 into 3 equal groups. Write $48 \div 3$ or $3 \overline{)48}$
Make a model to show how many are in each group.

<p>Step 1 Show 48 as 4 tens and 8 ones. Draw circles to make 3 equal groups.</p>		
<p>Step 2 Place an equal number of tens into each group.</p>		
<p>Step 3 Regroup 1 ten and 8 ones as 18 ones. Place an equal number of ones into each group.</p>		

So, $48 \div 3 = 16$

Activity 2

Here is a way to record division. Divide 57 by 2.

<p>Step 1 Show the model and 2 equal groups.</p>			<p>Record:</p> $\begin{array}{r} 2 \overline{)57} \end{array}$
<p>Step 2 Divide the tens.</p>			$\begin{array}{r} 2 \\ 2 \overline{)57} \\ - 4 \\ \hline 1 \end{array}$ <p>2 tens in each group 4 tens used 1 ten left</p>
<p>Step 3 Regroup. Divide the ones.</p>			$\begin{array}{r} 28 \text{ R } 1 \\ 2 \overline{)57} \\ - 4 \\ \hline 17 \\ - 16 \\ \hline 1 \end{array}$ <p>8 ones in each group 16 ones used 1 one left</p>

So, $57 \div 2 = 28 \text{ R } 1$

Notes for parents :

- Guide your child to model a division problem starting with tens, this is a more efficient method.

Exercise 41

7-13 The Partial Quotients Algorithm

7-14 The Standard Division Algorithm

REMEMBER

UNDERSTAND

APPLY

PROBLEM SOLVING

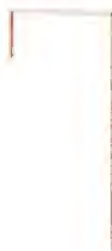
From the school book

3. Use the partial quotient algorithm to divide.

a. $72 \div 4$



b. $517 \div 4$



c. $244 \div 6$



d. $780 \div 5$



e. $897 \div 4$



f. $376 \div 7$



g. $590 \div 5$



h. $892 \div 4$



i. $925 \div 6$



j. $1,216 \div 3$



k. $3,784 \div 8$



l. $7,830 \div 5$



2. Complete to estimate the quotient.

a. $72 \div 3$

The dividend 72 is between 60 and 90, then $60 \div 3 =$, $90 \div 3 =$

, then the quotient is between _____ and _____

b. $524 \div 4$

The dividend 524 is between 400 and 800, then $400 \div$ _____ $=$ _____

, $800 \div$ _____ $=$ _____

, then the quotient is between _____ and _____

c. $735 \div 2$

The dividend 735 is between _____ and _____, then _____ $\div 2 =$ _____

, _____ $\div 2 =$ _____

, then the quotient is between _____ and _____

d. $7,462 \div 5$

The dividend 7,462 is between _____ and _____, then _____ \div _____ $=$ _____,

_____ \div _____ $=$ _____

, then the quotient is between _____ and _____

3. Estimate each quotient.

a. $632 \div 8 =$ _____

b. $312 \div 4 =$ _____

c. $762 \div 9 =$ _____

d. $495 \div 6 =$ _____

e. $536 \div 8 =$ _____

f. $3,748 \div 2 =$ _____

g. $4,681 \div 3 =$ _____

h. $8,642 \div 5 =$ _____

4. Copy and complete.

a. $\square 8$

$$\begin{array}{r} 3 \overline{) 54} \\ - 3 \\ \hline 2 \\ - 2 \\ \hline 0 \end{array}$$

b. $2 \square R1$

$$\begin{array}{r} 4 \overline{) 85} \\ - \\ \hline 0 \\ - 4 \\ \hline \end{array}$$

c. $\square 1 R3$

$$\begin{array}{r} 5 \overline{) 58} \\ - \\ \hline 8 \\ - 5 \\ \hline \end{array}$$

d. $\square \square R \square$

$$\begin{array}{r} 3 \overline{) 41} \\ - 3 \\ \hline \\ - \\ \hline \end{array}$$

5. Solve the problems using the standard algorithm.

a. $454 \div 3$

b. $192 \div 6$

c. $778 \div 2$

Work area

d. $240 \div 6$

e. $414 \div 4$

f. $761 \div 6$

Work area

g. $368 \div 3$

h. $1,304 \div 4$

i. $4,858 \div 4$

Work area

j. $3,650 \div 5$

k. $1,500 \div 5$

l. $5,765 \div 5$

Work area

m. $2,534 \div 7$

n. $2,920 \div 8$

o. $3,287 \div 9$

Work area

6. If you had 52 sandwiches to put into 4 lunch boxes.

, how many sandwiches would go into each box if you divided them equally?



7. A train has 784 seats for passengers. If there are 7 cars on the train and each car has the same number of seats, how many passengers can sit in each car? Solve the problem using at least two different strategies.



$$784 \div 7$$

First strategy

Second strategy

8. **Science** Peanuts grow underground in pods. Each pod is attached to the stem. Suppose you dug up 3 peanut plants and gathered 87 pods. How many pods might have been attached to each plant?



9. There are 154 tourists divided into equal groups. If each group has 7 tourists, how many groups will there be?
10. Nermine takes the train to the city and back 4 times each month. She travels a total of 376 km per month. How far away is the city?
11. Sami has 960 beads in 8 different colors to make jewelry. He has the same number of each color. How many beads of each color does sami have?



Challenge

12. Youssef divided a number between 55 and 60 by 5. The remainder was 4. What number did youssef divide?

Choose the correct answer.

1. $366 \div 6 =$

- A. 60
C. 64

B. 61

D. 71

2. $74 \div 4 = 18 \text{ R}$



A. 0

C. 2

B. 1

D. 3

3. $36 \div 2 = 18 \text{ R}$

- A. 0
C. 2

B. 1

D. 3

4. $1,836 \div 3$ is closer to



A. 6

C. 600

B. 60

D. 6,000

5. $7,158 \div 3$ is closer to

- A. 20
C. 3,000

B. 2,000

D. 40,000

6. $736 \div 4$ is closer to



A. 10

C. 200

B. 100

D. 1,000

7. Sara has 270 pieces of ribbon. She wants to give an equal number of them to 8 of her friends. How many pieces of ribbon will each friend receive and how many will be left over?

- A. Each friend will receive 32 pieces. There will be 14 pieces left over.
B. Each friend will receive 34 pieces. There will be 2 pieces left over.
C. Each friend will receive 33 pieces. There will be 6 pieces left over.
D. Each friend will receive 33 pieces. There will be 0 pieces left over.

8. Marawan divides $617 \div 5$ using the partial quotients algorithm. He uses 100 as the quotient on the first step. What is his next step?

$$5 \overline{) 617} 100$$

- A. Multiply 100 by 617 and subtract the result from 5.
B. Multiply 100 by 617 and add the result to 5.
C. Multiply 100 by 5 and subtract the result from 617.
D. Multiply 100 by 5 and add the result to 617.

Lesson 9

7-15 Division and Multiplication 7-16 Solving Challenging Story Problems

Learn

The relation between multiplication and division

There are 736 crayons wanted to be divided among boxes. Each box holds 4 crayons. How many boxes are needed?

Divide: $736 \div 4$

Estimation can help decide whether an answer is reasonable. Division can help solve the problem.

Multiplication can help check the answer.



Known that

Multiplication and division by the same number are opposite operations or inverse operations. One operation undoes the other.

First Estimate the quotient

The dividend 736 is between 400 and 800

Note that

400 and 800 are multiples of 4

then: $400 \div 4 = 100$ and $800 \div 4 = 200$

So, the quotient is between 100 and 200

Second Divide $736 \div 4$

The number of boxes = $736 \div 4$
= 184 boxes

The answer is reasonable.

Third Multiply to check

$184 \times 4 = 736$

So, the needed boxes are 184 boxes

Algorithm strategy

$$\begin{array}{r} 184 \\ 4 \overline{) 736} \\ \underline{-4} \\ 33 \\ \underline{-32} \\ 16 \\ \underline{-16} \\ 00 \end{array}$$

Partial strategy

$$\begin{array}{r} 184 \\ \times 4 \\ \hline 16 \\ + 320 \\ + 400 \\ \hline 736 \end{array}$$

Notes for parents :

- Ask your child to tell you what is the relation between multiplication and division.

Example 1

Write the division problem that matches the multiplication problem.

$$\begin{array}{r} 34 \\ \times 2 \\ \hline 68 \end{array}$$

$$\begin{array}{r} \text{b. } 518 \\ \times 3 \\ \hline 24 \\ + 30 \\ + 1,500 \\ \hline 1,554 \end{array}$$

$$\begin{array}{r} \text{c. } 908 \\ \times 7 \\ \hline 56 \\ + 0 \\ + 6,300 \\ \hline 6,356 \end{array}$$

Solution 

a. $68 \div 2 = 34$

b. $1,554 \div 3 = 518$

c. $6,356 \div 7 = 908$

Example 2

Write the division problem that matches the multiplication problem.

a. $14 \times 2 = 28$

b. $161 \times 5 = 805$

c. $105 \times 7 = 735$

d. $320 \times 6 = 1,920$

Solution 

a. $28 \div 2 = 14$

b. $805 \div 5 = 161$

c. $735 \div 7 = 105$

d. $1,920 \div 6 = 320$

Check your understanding

Write the division problem that matches the multiplication problem.

$$\boxed{} \div \boxed{} = \boxed{}$$

$$\begin{array}{r} 27 \\ \times 6 \\ \hline 42 \\ + 120 \\ \hline 162 \end{array}$$

*Ask your child to explain how can he/she uses the relation between multiplication and division to solve multiplication and division problems.

Learn**Solving challenging story problems**

Here are some guided steps you may use when solving problems.

**Read to understand**

- Read the story loudly more than one time carefully.
- Identify the details and quantities given.
- Identify the hidden question (if exists).
- Search for key words.

**Plan**

- Decide the operation $[+, -, \times, \div]$.
- Decide the strategy you can use to solve the problem.

**Solve**

- Solve the hidden question (if exists).
- How can you use the strategy to solve the problem?

**Check**

- How do you know your answer is correct?
- What other strategy could you use to solve the problem?



Read to understand



Plan



Solve



Check

**Example 3**

Read the following problem carefully. Solve the problem.

Sandy bought 5 packs of crayons. There are 24 crayons in each of those packs. She also had 6 smaller packs of crayons. There are 12 crayons in each of those.

Sandy wanted to bring all her crayons to school and give them to 8 of her friends.

How many crayons will each friend get?

Notes for parents :

- Remind your child that multistep problem is a problem that involves more than one operation.

Solution

First hidden questions: How many crayons in the 5 packs?

The number of crayons = $5 \times 24 = 120$ crayons.

Second hidden question: How many crayons in the 6 small packs?

The number of crayons = $6 \times 12 = 72$ crayons.

Third hidden question: How many crayons in all?

The number of all crayons = $120 + 72 = 192$ crayons.

The problem: How many crayons will each friend get?

The number of crayons = $192 \div 8 = 24$ crayons.

Short way:

$$[(5 \times 24) + (6 \times 12)] \div 8 = (120 + 72) \div 8$$

$$= 192 \div 8 = 24 \text{ crayons}$$

Check the results
using the standard
algorithm strategy



Check your understanding

Maged has 293 stickers. Amgad has 5 times as many as Maged. Shady has 699 fewer than Amgad. How many stickers does Shady have?

Amgad has = \times = stickers.

Shady has = $-$ = stickers.

*Some word problems have hidden question or questions that must be answered before you can solve the problem. You have to determine what operation to use and what strategies will you use to help you figure out how to solve the problem.

Exercise 42

7-15 Division and Multiplication

7-16 Solving Challenging Story Problems

REMEMBER

CONVERT

PLAN

PROBLEM SOLVING

From the school book

1. Write the division problem that matches the multiplication problem.

a.

$$\begin{array}{r} 48 \\ \times 5 \\ \hline 240 \\ + 240 \\ \hline 288 \end{array}$$

$$\boxed{} \div \boxed{} = \boxed{}$$

b.

$$\begin{array}{r} 75 \\ \times 4 \\ \hline 20 \\ + 280 \\ \hline 300 \end{array}$$

$$\boxed{} \div \boxed{} = \boxed{}$$

c.

$$\begin{array}{r} 162 \\ \times 8 \\ \hline 16 \\ + 480 \\ + 800 \\ \hline 1,296 \end{array}$$

$$\boxed{} \div \boxed{} = \boxed{}$$

d.

$$\begin{array}{r} 615 \\ \times 9 \\ \hline 45 \\ + 90 \\ + 5,400 \\ \hline 5,535 \end{array}$$

$$\boxed{} \div \boxed{} = \boxed{}$$

2. Write the division problem that matches the multiplication problem.

a. $53 \times 6 = 318$

$$\boxed{} \div \boxed{} = \boxed{}$$

b. $623 \times 3 = 1,869$

$$\boxed{} \div \boxed{} = \boxed{}$$

c. $325 \times 4 = 1,300$

$$\boxed{} \div \boxed{} = \boxed{}$$

d. $505 \times 5 = 2,525$

$$\boxed{} \div \boxed{} = \boxed{}$$

e. $42 \times 7 = \boxed{}$

$$\boxed{} \div \boxed{} = \boxed{}$$

f. $93 \times 9 = \boxed{}$

$$\boxed{} \div \boxed{} = \boxed{}$$

g. $173 \times 6 = \boxed{}$

$$\boxed{} \div \boxed{} = \boxed{}$$

h. $349 \times 8 = \boxed{}$

$$\boxed{} \div \boxed{} = \boxed{}$$

Place Value and the Quotient : First, circle the problems you think will have a quotient with fewer digits than the dividend. Then, estimate the quotient and solve each problem using the standard algorithm for division. Think about where to place the first digit in the quotient.

a. $714 \div 2$

The quotient is between _____ and _____

Solution : _____

b. $1834 \div 3$

The quotient is between _____ and _____

Solution : _____

c. $346 \div 5$

The quotient is between _____ and _____

Solution : _____

d. $562 \div 8$

The quotient is between _____ and _____

Solution : _____

e. $1,266 \div 6$

The quotient is between _____ and _____

Solution : _____

f. $1,632 \div 4$

The quotient is between _____ and _____

Solution : _____

g. $1,427 \div 7$

The quotient is between \quad and \quad

Solution :

h. $6,570 \div 3$

The quotient is between \quad and \quad

Solution :

4. Solve the following problems. You may use multiplication to check your answers.

a. $154 \div 4 =$

h. $777 \div 3 =$

c. $127 \div 5 =$

d. $1,344 \div 4 =$

e. $1,545 \div 5 =$

f. $2,775 \div 3 =$

g. $4,524 \div 4 =$

h. $3,937 \div 3 =$

i. $534 \div 4 =$

j. $8,579 \div 9 =$

5. Solve the following story problems.

a. Yahlia placed 21 paints equally on 3 tables.

How many paints were placed on each table?

المسألة

المعطيات

المطلوب

الحل

الاجابة

والله اعلم

b. Sarah received 352 L.E. for her birthday. She found some toys that cost 8 L.E. each.

How many toys could she buy?

- c. Ahmed and his mom want to plant a garden. They buy 35 tomato plants, 16 carrot plants, and 9 beet plants. They want to put the plants into rows of 6. How many plants will be in each row?

- d. There are 164 students who play wind instruments and 20 students who play percussion in the band. If the band instructor puts 8 students in each row, how many rows will there be?

- e. Reem is stuffing envelopes. There are 1,500 envelopes. During the first hour, Reem stuffs 135 envelopes. During the second hour, she stuffs 141 envelopes. How many envelopes will Reem need to stuff in order to finish the job?

- f. Ahmed serves ice cream at a local ice cream shop. He sold 19 ice cream cones on Saturday, 27 ice cream cones on Sunday, and 153 ice cream cones for the entire week. How many ice cream cones did Ahmed sell in all?

- g. Hady has 347 marbles. Kamal has 4 times as many as Hady. Hala has 799 fewer than Kamal. How many marbles does Hala have?

- h. Over the course of 20 weeks, Sarah collected 14 kilograms of cans to recycle, Saleem collected 6 times as much as Sarah. The cans need to be put into bags to take to the recycling center. Each bag holds 7 kilograms of cans.
How many bags will Saleem need for his cans?

- i. A teacher bought 12 packs of crayons. Seven of the packs had 9 crayons in each. The other 5 packs had 10 crayons in each. How many crayons did the teacher buy in all?

- j. Mira bought 4 packs of pencils. There were 28 pencils in each of those packs. She also had 3 smaller packs of pencils at her house. There were 12 pencils in each of those. Mira wanted to bring all her pencils to school and give them to 4 of her friends equally. How many pencils will each friend get?

- k. Four families went to the zoo. Each family has 2 adults and 2 children. Each child's ticket costs 14 L.E. and each adult's ticket costs 22 L.E.
How much will the zoo tickets cost in all?

Multiple Choice Questions

Choose the correct answer.

1. The division equation that matches $126 \times 3 = 378$ is _____

A. $378 - 3 = 126$
 B. $378 + 3 = 126$
 C. $378 \div 3 = 126$
 D. $378 \times 3 = 126$

2. Which expression can be used to check the solution of the opposite division problem?

$$\begin{array}{r} 28R4 \\ 9 \overline{) 256} \\ \underline{- 18} \\ 76 \\ \underline{- 72} \\ 4 \end{array}$$

A. 28×9
 B. 28×256
 C. $28 \times 9 + 4$
 D. $28 \times 256 + 4$

3. In the problem $1,866 \div 6$, the quotient is between _____ and _____

A. 100 and 200
 B. 200 and 300
 C. 300 and 400
 D. 400 and 500

4. What is the value of ? in the opposite division problem?

$$\begin{array}{r} ? \\ 4 \overline{) 292} \\ \underline{- 28} \\ 12 \\ \underline{- 12} \\ 0 \end{array}$$

A. 73
 B. 73 R1
 C. 73 R2
 D. 73 R3

5. $48 \div 7 =$ _____

A. 6 R4
 B. 6 R5
 C. 6 R6
 D. 7 R1

6. $320 \div 4 =$ _____

A. 80
 B. 90
 C. 80 R3
 D. 90 R3

7. $2,014 \div 2 =$ _____

A. 17
 B. 107
 C. 1,007
 D. 10,007

8. $2,748 \div 9 =$ _____

A. 304 R2
 B. 304 R3
 C. 305 R2
 D. 305 R3

9. Hazim has 531 marbles. Ahmed has 3 times as many as Hazim. Rana has 689 fewer than Ahmed.

How many marbles does Rana have?

A. 1,593 marbles
 B. 215 marbles
 C. 904 marbles
 D. 2,282 marbles

10. Dina distributed 965 pounds among her 5 sons. If she gave each son 150 pounds more as a present

, what is the share of each son?

A. 43 pounds
 B. 143 pounds
 C. 193 pounds
 D. 343 pounds

Concept 2 Assessment | Unit 7



1. Write (✓) to the correct answer and (X) to the incorrect answer.

- | | | |
|--|---|---|
| a. $180 \div 2 = 9$ | (|) |
| b. $63 \div 6 = 10$ and the remainder = 3 | (|) |
| c. $35,000 \div 5 = 7,000$ | (|) |
| d. If $1,095 \div 3 = 365$, then the divisor is 3 | (|) |
| e. $4 \div 24 = 6$ | (|) |
| f. $240 \div 2 = 120$ | (|) |

2. Choose the correct answer.

- | | | | |
|---|----------|----------|-----------|
| a. $30 \div 4 =$ _____ | | | |
| A. 7 R1 | B. 6 R2 | C. 7 R2 | D. 7 R4 |
| b. $255 \div 5 =$ _____ | | | |
| A. 11 | B. 50 | C. 51 | D. 55 |
| c. $9,342 \div 3$ is closer to _____ | | | |
| A. 300 | B. 3,000 | C. 4,000 | D. 5,000 |
| d. $6,300 \div 9 =$ _____ | | | |
| A. 70 | B. 700 | C. 7,000 | D. 70,000 |
| e. $42 \div 6 =$ _____ | | | |
| A. 7 R0 | B. 7 R2 | C. 6 R0 | D. 6 R1 |
| f. If $973 \div 3 = 325$, then the dividend is _____ | | | |
| A. 3 | B. 325 | C. 973 | D. 322 |

3. Complete the following.

- a. The quotient of $3,019 \div 3$ equals _____
- b. _____ $\div 7 = 800$

c. By dividing $76 \div 2$ using the standard algorithm, the first division is $\underline{\hspace{1cm}} \div \underline{\hspace{1cm}}$, the next division is $\underline{\hspace{1cm}} \div \underline{\hspace{1cm}}$, and the quotient is $\underline{\hspace{1cm}}$.

d. $3,856 \div 4 = \underline{\hspace{2cm}}$

e. The quotient of $736 \div 6$ is closer to $\underline{\hspace{2cm}}$.

f. The division problem in the opposite area model is $\underline{\hspace{1cm}} \div \underline{\hspace{1cm}}$

5	$5 \times 20 = 100$	$5 \times 5 = 25$
	20	5 R 3

4. Match.

a. $88 \div 3$

1. 71×2

b. $360 \div 4$

2. $150 + 7$

c. $568 \div 4$

3. $176 \div 6$

d. $785 \div 5$

4. 30×3

5. Use the area model to divide $774 \div 7$

6. Use the partial quotient algorithm to divide.

$$3,128 \div 3$$

7. What are the missing values in the opposite division problem?

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<div style="display: flex; justify-content: space-between;"> 3 4 5 7 </div> <div style="display: flex; justify-content: space-between;"> - 3 ↓ ↓ ↓ </div> <hr style="border: 0.5px solid black; margin: 2px 0;"/> <div style="border: 1px solid black; padding: 2px 10px; text-align: center;"> <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div> </div>
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8. Maged estimated $7,924 \div 4$ as he rounded 7,924 to 7,000, then divided $7,000 \div 4 = 1,750$, but he found that the answer 1,981 is not reasonable.

Explain the mistake of Maged and fix it.